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The Battle Against Food Waste – What Have European Food Retailers Done?

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<p>Food waste is a global issue that causes major damage economically, environmentally and socially. Stakeholders carry a shared responsibility for the waste and more effort is needed to prevent its creation. Retailers, an affluent link in the food supply chain (FSC), can make a difference. Solving the food waste issue requires comprehending what has already been done. Understanding the field and analyzing the impacts of different kind of food waste initiatives from various perspectives can benefit the food industry as well as non-governmental organizations and public authorities on the path towards more sustainable processes.</p> <p>The aim of this research is to define what kind of food waste initiatives have been implemented among the leading European food retailers between the years 2011 and 2014. The research is carried out from a European perspective as its field of food trade is considered unique in terms of policies, integration and the development of the functions of the FSC.</p> <p>The research was implemented through a qualitative content analysis from a deductive point of view during autumn 2014. The theoretical framework of the paper consists of literature related to the European food retail sector, the food waste issue and corporate social responsibility (CSR). The data used in the content analysis was collected from Europe's leading retailers' CSR reports and homepage publications. It was then analyzed from various perspectives, with an emphasis to the causes of food waste and the theory of CSR.</p> <p>The research found that retailers have implemented several different food waste programs which vary with respect to their objectives, duration, strategic integration and operational aspects. The initiatives present a variety of economic, environmental and social CSR dimensions and outputs. The paper argues that retailers have used innovative solutions in their food waste programs that have resulted in environmental and other benefits.</p>		
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1 Introduction

Food waste is a global issue that causes extensive damage economically, environmentally and socially. In Europe approximately one third, over 100 million tons, of the food produced for human consumption is wasted every year. There is an alarming demand for more sustainable and more efficient food systems as the world population is rising, populations' nutrition standards are improving and dietary preferences are shifting, urbanization is accelerating and climate change is a major concern. (Lundqvist, De Fauture & Molden 2008, 5–6, 21; Nellesmann et al. 2009, 6–7; Godfray et al. 2010; Gustavsson, Cederberg, Sonesson, Van Otterdijk & Meybeck 2011; IMECHE 2013, 25; UN 2013a.)

The battle against food waste has already been launched. Several regional, national and international, short- and long-term, privately as well as publicly funded programs have been established (HLPE 2014, 57; see also Silvennoinen, Koivupuro, Katajajuuri, Jalkanen & Reinikainen 2012; FoodCycle 2014; Robineau 2014; Zero Waste Europe 2014). However, more needs to be done as a number of key businesses have not integrated responsibility dimensions in their operations and strategies (European Commission 2011a, 5) even when voluntary collective actions and business engagement could prevent the creation of a large portion of the food waste (UNEP 2014, 44). There is a demand for even more pro-activity in both public and private sectors (Coggins 2001; Lundqvist et al. 2008; Godfray et al. 2010; Gustavsson et al. 2011).

The amount and impact of food waste are expected to increase significantly by the year 2020 if sufficient prevention actions are not implemented (European Commission 2010a, 105). Although the key factors of food waste reduction are relatively broadly studied (HLPE 2014) and various programs have been adopted, there has been little research on private food waste reduction initiatives carried out by retailers. As the food waste issue remains largely unsolved, it is important to learn what kind of initiatives have been followed through, what kind of common factors the efforts have had and what kind of outputs they have resulted in. Understanding the issues and analyzing the impacts of food waste programs from various perspectives can benefit the food industry as well as non-governmental organizations and public authorities on their path towards more sustainable processes.

This paper investigates food waste reduction initiatives implemented among the leading European food retailers between the years 2011 and 2014. The aim of the research is to identify characteristics of the various activities in the context of leading European food retailers following the concepts of Corporate Social Responsibility (CSR). Further the objective is to analyze what kind of outcomes different kind of initiatives can create. The research is carried out through a qualitative content analysis.

1.1 General context

Most of the European food waste is created at the end of the food supply chain (FSC) where it's economic and environmental costs are at their highest considering that the food production process consumes incrementally more and more natural resources and energy (FAO 2012, 11). Research has found that raising consumers' awareness of sustainability and food waste could result in changes in consumption patterns and thus remarkably curb the amount of waste (Parfitt, Barthel & Macnaughton 2010, 3079; HLPE 2014). In the middle- and high-income countries the impact of initiatives at producer and industrial level would only be marginal if consumers keep on wasting food at current levels (Gustavsson et al. 2011, 15).

The “shared responsibility” that the stakeholders have for the society and the environment has been recognized (Davis 1960; Porter & van der Linde 1995; European Commission 2011b, 17). Recently, in October 2014, three UN organizations launched a digital platform, addressed for all the stakeholders, which aims to reduce food waste through information sharing (FAO 2014). The significance of the commitment of all stakeholders was well described in the launch event of the program by FAO's (Food and Agriculture Organization of the UN) Deputy-Director General of Natural Resources: “When food is saved, the resources used to produce it are saved. Reducing waste and losses by not creating these in the first place should be a priority for all” (FAO 2014).

The food industry, especially food retailers, can make a difference (Parfitt et al. 2010, 3079). In addition to having the opportunity to impact the amount of waste created in stores, the retailers' input can influence the earlier stages of the FSC (Maloni & Brown 2006, 41; Stuart 2009, 102–117; UNEP 2014, 25) as well as the customer behaviors that cause the high levels of food waste (Quested, Parry, Eastel & Swannell 2011, 465; Stenmarck, Hanssen,

Silvennoinen, Katajajuuri & Werge 2011, 38; European Parliament 2012). Retailers' initiatives can possibly lead to the creation of more sustainable production and consumption patterns and to a significant reduction of waste (UNEP 2014, 8). Therefore, the participation of the food retail sector in the battle against food waste is particularly crucial – retailers can have influence on several stakeholders.

Food waste programs adopted by European food retailers have not been widely in the focus of previous research. In 2011 a Nordic research “Initiatives on Prevention of Food Waste in the Retail and Wholesale Trades” (Stenmarck et al. 2011) was published. The report initiated by Nordic Council of Ministers focuses on the amounts and causes of food waste as well as the initiatives and recommendations that could change the food waste situation. The project investigates solely Denmark, Norway, Sweden and Finland, and it emphasizes “country specific findings.” The research found that activities have concentrated in procedures, such as the development of order management systems, the betterment of food handling practices and the provision of education for the personnel. (Stenmarck et al. 2011.)

Some national researches have examined retailers' activities and attitudes in food waste reduction. The Waste and Resources Action Program (WRAP) has published two surveys in order to discover UK retailers' activity in reducing household food waste. The findings argue that retailers have reduced the supply of oversized food packages and raised awareness of food waste. In addition, the retailers are reported to have modified date label practices by removing confusing “sell by” dates and by providing clear storing instructions. (WRAP 2009, WRAP 2012.) A Finnish research examined food waste production in Finland within the different parts of the FSC. The findings of the research present data about the approximate amounts of waste and suggest that retailers waste mainly fruits, vegetables and bread. In addition, the research points out some specific causes for food waste. (Silvennoinen et al. 2012.)

Other previous research, such as those by Lundqvist et al. (2008), Parfitt et al. (2010), Gustavsson et al. (2011) and Kummu et al. (2012) have mainly focused on food waste in a wide context emphasizing its causes and impacts. Furthermore, several researches highlight the responsibility of the different sections of the FSC, some of them underlining the retailers' significance (Coggins 2001; Mena, Adenso-Diaz & Yurt 2011). Surveys have also mapped

out the amounts of household food waste in different countries (KFS 2009; Knudsen 2009; WRAP 2009). In addition, the report of UNEP (2014) offers food waste guidance for businesses and households. This paper contributes to the field of research by providing specific information about the scope and nature of European retailers' responsibility efforts. Furthermore it analyzes the dimensions and potential outcomes of the food waste programs.

The purpose of this paper is to gain an understanding of European food retailers' current efforts in the battle against food waste by identifying characteristics and dimensions of their responsibility activities. The empirical part of the research emphasizes a link with CSR literature. The research focuses on European firms, where the degree of the development of sustainability strategies is similar and follows a relatively common philosophy (López, Garcia & Rodriguez 2007, 287). The European field of food trade is considered unique in terms of policies, integration and the development of the functions of the FSC (Poole, Clarke & Clarke 2002; European Commission 2014a). In order to cut down the amount of food waste it is necessary for the private sector to get involved, and thus it is crucially important to understand how the issue of food waste is being confronted among retailers.

1.2 Study purpose and objectives

Previous literature has studied the sources of food waste in Europe and defined ways to reduce it, but little attention has been given to the research on private food retailer initiatives. Although there is a strong demand for new programs in the private sector, little information has been gathered about the characteristics and outcomes of the existing efforts. The main objective of this study is to define what kind of food waste initiatives have been implemented among the leading European food retailers between the years 2011–2014. The research does not aim to simply map out the activities realized by large European food retailers, but to gain an understanding of the versatile field of a variety of initiatives. This includes an analysis of the means of waste reduction as well as an examination of the dimensions and outputs of the food waste programs. The main research question is derived from these objectives:

- 1. What kind of food waste initiatives have been implemented in the European food retail sector between the years 2011–2014?*

Additionally, as food waste occurs along the whole FSC due to several reasons (see section 2.2.4), the objective is to analyze which causes of food waste are most frequently targeted by retailers. Furthermore, the research aims to define if the retailers' food waste efforts emphasize waste management within certain links of the FSC. Contributing to the main research question, the purpose of this paper is to investigate whether the retailers' responsibility efforts have some common characteristics or differences. The sub-questions of the research are drawn from these objectives.

2. Do the food waste programs target some specific causes of food waste?

3. Do the retailers' efforts have some common characteristics or differences?

This paper is structured as follows. The second chapter provides an overview of the European food retail sector and the food waste issue. The third chapter presents the theoretical background of the study related to the field of CSR. It clarifies the main concepts and terms used in the paper. The fourth chapter examines the theoretical framework in which the key concepts of the paper are summarized. The fifth chapter discusses the methodology of the content analysis applied in the research. In the sixth chapter the findings of the content analysis are analyzed based on the theoretical framework. The seventh chapter presents the conclusions and the limitations of the research and asks for further study. Finally, the list of the references is composed in the eighth chapter.

1.3 Definitions and scope

The Swedish Institute for Food and Biotechnology (2014, 6) defines food waste as “any food, and inedible parts of food, removed from the food supply chain to be recovered or disposed,” including composted, not harvested or bio-energy production losses. FAO defines food waste as food losses occurring during retail and final consumption phases emphasizing the late section of the FSC. In FAO's approach “food waste” is different from “food losses”: the latter is produced during the early production in the food supply chain (Gustavsson et al. 2011). In this paper “food waste” refers to the definition of the Swedish Institute for Food and Biotechnology considering that the concept refers to the discarding of food items within the entire FSC.

The concept of a structured FSC is frequently associated “with industrialized countries where post-harvest processing and large retail sectors are important features” (Parfitt et al. 2010, 3066). The FSC consists of all of the different links needed for food production and supply from “farm-to-fork.” In a western context, the agricultural sector, such as farmers and producers, provides inputs for food production. The inputs are processed by manufacturers (also referred as “processors”) and sold as products to the retail sector. The consumers are at the end of the chain as end users of the food products. (Lundqvist et al. 2008, 20-21; (Parfitt et al. 2010, 3066; Hansen 2013, 16-17.)

This research focuses on food retailers, referring to the grocery industry. The “leading retailers” and “large retailers” refer to the target group of this research: food retailers that have been ranked at the top based on revenue in the listings of the leading global retailers (see section 5.2.3). The leading retailers are remarkably large in terms of the extent of their operations, as many of them have hundreds or more stores and operate internationally. The paper does not consider the small or medium-sized food retailers as they compete with relatively different strategies in regards to the environment, size and other aspects of their business (European Commission 2014a, 25) and because of their different levels of activity in CSR activities and reporting (Hartmann 2011, 310–312).

Out of the 15 countries representing the cases of the research 13 are EU members and two, Norway and Switzerland, are non-EU countries. Due to the dominance of EU members, the research is considered having a strong connection to the EU. Thus, part of the literature includes descriptive data focusing on EU countries.

This research does not emphasize the activities implemented in the public sector. However, some of the cases analyzed further may have an aspect of public-private partnership.

2 Overview of the European food retail sector and the food waste issue

Food waste is a global problem, but the structure of its production and the underlying reasons vary between regions. Its structure can be roughly divided in two: middle- and high-income countries struggle with food waste created in the late sections of the FSC and low-income countries with food waste that arises in the beginning of the chain. (Gustavsson et al. 2011; HLPE 2014, 11–12.) As value is added in every stage of production, the effects of food waste engendered at the end of the chain get compounded in high economic and environmental impacts (FAO 2012, 11). Consequently, this research focuses on the food waste battle from a European perspective.

The food sector is different from any other sector due to its special biological, structural and market-related conditions. It is highly dependent on natural resources while at the same time it has remarkable impacts on the environment. (Hansen 2013.) The food retail sector, an influent link in the FSC (Gustavsson et al. 2011, 15; Hansen 2013), has a role to play in the battle against food waste (Parfitt et al. 2010, 3079). The sector's whose economic power has increased during recent years (European Commission 2014a, 250) carries a significant responsibility for waste because it can influence consumers and their behavior (Quested, Parry, Eastel & Swannell 2011, 465; Stenmarck et al. 2011, 38; European Parliament 2012). The following sections provide insight to the European food retail sector, the structure of the FSC and the food waste issue in order to perceive the context of the research.

2.1 European food retail sector

The food retail sector is an important player in the European economy and decisions made in its field affect the consumption patterns of millions of Europeans. The sector's contribution to the European economy is substantial; in 2011 its turnover reached 1.11 trillion of euros and 156 billion in added value (European Commission 2012). The ten leading European food retailers accounted for 31 percent market share (European Commission 2014a, 25). The expansion of the market share of leading retailers has been notable during several years – in 2000 they accounted for a market share of only 26 percent. Although the market share of

leading retailers has increased, edible grocery sales have remained stable for the recent years (European Commission 2014a, 25).

The rise of the significance of the sector has been strongly affected by the development of food production methods, globalization and macro-level factors, such as free trade, urbanization and economic growth. The global agro-food system has developed notably during the 21st century from local small-scale production patterns to the modernization and mechanization of processes. This has led to the formation of wide cross-continental food chains. (Barrett, Ilbery, Browne & Binns 1999; Poole et al. 2002; Fold & Pritchard 2005, 1–3; Hatanaka, Bain & Busch 2005, 356.) Consequently, the different links of the FSC, such as farmers, producers and consumers, have experienced geographical disconnection (Torjusen, Lieblein, Wandel & Francis 2001; Ilbery & Maye 2005). Food is often being produced in a different place than where it is sold and consumed. Lundqvist et al. (2008, 4) argue that disconnection is one of the causes of food waste.

The modernization of food trade has led to concerns about its sustainability. As a result, during the last decade criticism towards the international food system has arisen. Concerns over the sustainability and food safety factors together with increased environmental awareness have led to the emergence of shorter FSC's (Ilbery & Maye 2005) and the growing demand for local and organic food among consumers (Padel & Foster 2005; Hughner, McDonagh, Prothero, Shultz & Stanton 2007).

Officials and the retail sector have reacted to the criticism. As an example, in 2009 an organization was established bringing together various European retailers: the European Retail Round Table (ERRT). Its aim is to “promote the delivery of a more sustainable consumption model.” (ERRT 2014.) This was followed by the formation of Retail Forum which brings together multiple stakeholders from the European retail sector, including some of the world's leading retailers. Retail Forum was launched in collaboration with the European Commission with the aim of creating more sustainable consumption and production patterns. (REAP 2012.) Although organizations such as the ERRT and Retail Forum bring together several key players from the field of food supply, it is worth noticing that members assisting in their conferences cover only a small percentage of European food retail companies. Many of the sustainability initiatives are operated individually or in collaboration with other organizations.

Retailers operate in an economy of limited resources and face several challenges in their attempts of developing more responsible patterns as they must simultaneously pursue strategies that maximize profits (Stenmarck et al. 2011; Silvennoinen et al. 2012, 36). Thus, the role of strategic CSR management and innovations that combine CSR with business operations are emphasized (Burge & Logsdon 1996; Jamali 2006, 810; Lankoski 2008a, 12–13; Lankoski 2008b; Kim, Brodhag & Mebratu 2014) (see section 3.1.2).

2.1.1 Economic and social roles of the food retail sector in Europe

The food retail sector has a significant role as an employer. In 2011 there were 839 000 food and drink retail companies in the EU. Together they employed approximately 6.1 million people, which accounts for 21 percent of the total employment share in the EU's FSC. The employment level of the whole FSC has a share of 11 percent of total employment in the EU. (FoodDrinkEurope 2013.)

The level of food retail concentration varies between European countries (OECD 2014). Highly competitive markets are considered to have positive impacts on consumer prices. Conversely, as competition decreases, consumer prices tend to increase in comparison to their level in highly competitive markets. Food prices are linked to several factors, such as climatic conditions, political stability and consumer demand (Hansen 2013), but the retail sector plays a role in maintaining stable and moderate food prices. Maloni and Brown (2006) argue that food retailers should support such prices that would allow food suppliers, such as farmers and other producers, avoid economic vulnerability and sustain efficient long-term business.

The competition in the European retail sector is intense (OECD 2014) and food retailers constantly look for new opportunities and strive for better strategies. Often the leading European food retailers seek for growth opportunities in international markets (Poole et al. 2002). The internationalization of the FSCs has modified the role of the retailers. Operating in international markets requires retailers to carry economic, environmental and social responsibilities in accordance with the local policies and the requirements of all stakeholders. In addition, as food is often traded internationally from one country to another, the retail sector has got a significant role in the supply chain management especially in relation to food standards and safety. The EU requires all imports arriving to the EU area's market to fulfill

the general principles and requirements of its food law. (Humphrey & Schmitz 2001, 23–24; Gereffi, Humphrey & Sturgeon 2006, 93.) As there is a growing demand for more responsibility, authorities have aligned principles and guidelines for enterprises. The OECD Guidelines for Multinational Enterprises and Social Policy, the UN’s Global Compact and the ISO 26000 Guidance Standard, among others, offer guidelines for large companies (European Commission 2011b, 6).

Food retailers have furthermore an impact on the selection of food that is supplied for consumers. European food retailers are independent companies which can choose the selection of food items they provide. By providing and promoting products retailers can influence consumers. They can claim to provide better, more sustainable or healthier products than their competitors. (Smith 2008, 850.) Thus, retailers can have an impact on customer behavior and habits. In addition to the consumer approach, retailer decisions can also have an impact on the previous links of the FSC. Their purchase decisions can affect the agricultural sector and manufacturers. (HLPE 2014.) Consequently, leading food retailers who have strong bargaining power in the FSC (Hansen 2013, 16–17) carry social and economic responsibility towards various shareholders.

2.1.2 Food retailers as a part of the food supply chain

The level of food production in Europe has remained stable for the last decades, but the amount of food companies has declined (Hansen 2013, 235). Currently the food retail sector tends to be relatively concentrated in several countries, especially in the old EU member states. The trend seems to be towards increased concentration and consolidation overall Europe. (OECD 2014, 17.) Although geographical distances have extended, the integration between the different links of the FSC is relatively close – the retail sector is the dominant intermediate and a mutual dependency exists between the different links (Lundqvist et al. 2008, 21; Parfitt et al. 2010, 3068; Hansen 2013, 16–17).

Grievink (2003; ref. Hansen 2013) has developed a model of the FSC in Europe (figure 1). The funnel presents the different operators of the supply chain together with the number of participants in each link (Hansen 2013, 16–17). As a remark, it should be noted that the model presents a simplified version of the supply chain and its segments – the supply chain’s structure is complex and the path of different product groups from “farm to fork” may vary. In addition

to the product itself varying, the route that each product follows changes also according to the size and market power of the supply chain members. (Maloni & Brown 2006, 38.)

Moving from one link of the FSC to another, resources are used and value is added. The different links require inputs, such as labor and energy. The model presents how in Europe a number of participants exist in the beginning and at the end of the supply chain, but relatively few powerful corporations dominate the central retail link in the middle of the chain (Hansen 2013, 6; UNEP 2014, 25). The buying desk and supermarket formats, which represent the retail sector, are presented in the middle of the funnel. Their numbers are small, but their power in the funnel is strong.

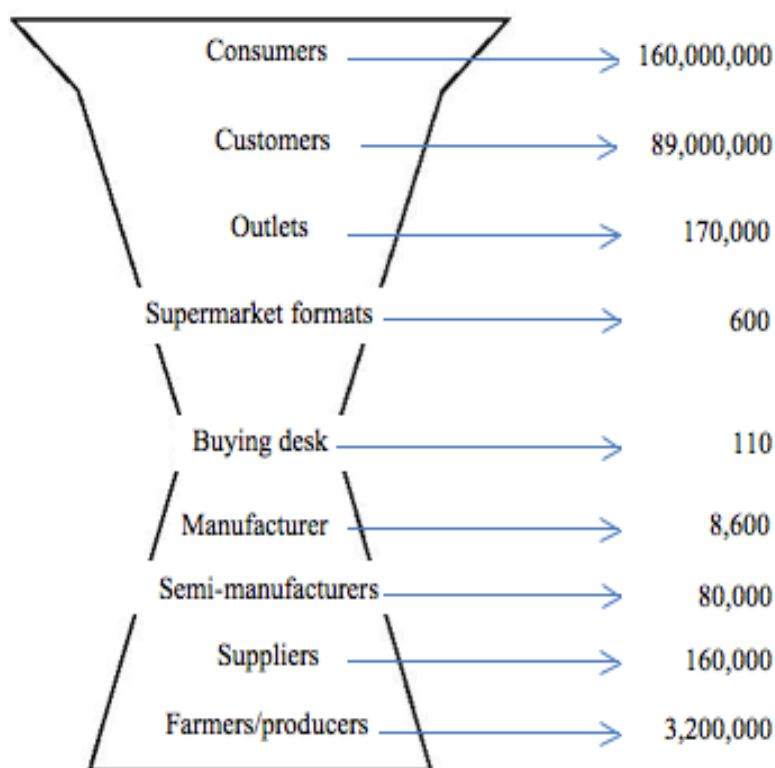


Figure 1. The supply chain funnel in Europe (Grievink 2003; ref. Hansen 2013, 16).

As the wholesalers' position in the supply chain has lost influence, the retailers nowadays have lots of power in the chain (Hansen 2013, 234–236). Since the 1960's large food retailers have captured a majority of food sales through their supermarket and hypermarket chains (Agra

Europe 1994; ref. Atkins & Bowler 2001, 91). The decision making tends to be centralized and the retailers have strong bargaining power.

Strategic alliances between the different links of the FSC play an important role in the growing bargaining position of food retailers. Strategic alliances can be either vertical or horizontal and their aim is to improve efficiency levels, reduce costs and increase bargaining power. Vertical alliances are arrangements, primarily led by retailers, between buyers and sellers within the different links of the FSC. Manufacturers and the agricultural sector agree to join these alliances, because they wish to reinforce their competitive strength in the retail environment or because they are forced to do so in order to maintain their position in the competitive business environment. Horizontal alliances differ from the vertical ones by involving businesses from the same segment of the marketing chain. (Fearne 1994, 30–31.) The structural development affects competitiveness and it has a strong impact on the power-relations of the different links of the FSC. (Hansen 2013, 234–236.)

This paper focuses on the retail sector due to its dominance in the chain. The retail sector is a link between the primary production and the consumption and thus it can be considered as an important link in the battle against food waste. As the supply chain can be seen as retail-driven (Hansen 2013, 6), decision making and procedures in the retail sector can influence the rest of the operators – retailers should “demonstrate responsible environmental care practices in their supply chains” (Maloni & Brown 2006, 41).

2.1.3 Retail channels

The European retailing sector has experienced structural changes from its early days. Today food retailers can be roughly divided in two groups based on their specialization. Specialized retailers, such as butchers or bakers, are food retailers offering narrow selection of differentiated products. Non-specialized retailers offer a wide variety of different kind of food, beverage and tobacco products. (Poole et al. 2002.) Markets and stalls are the third minor alternative for purchasing food products (Eurostat 2011, 120).

The European food retail sector is nowadays dominated by non-specialized retailers, although there are several country-specific differences in the structures of food retail channels. The

amount of specialized retailers has fallen by 75 percent since 1980 (Hansen 2013, 78). One of the main drivers behind the development of different kind of retail structure is convenience. In the past customers frequently purchased food products several times a week from specialized shops, but nowadays the frequency has diminished and a variety of products is being bought from a single store. (Eurostat 2011, 116.)

Non-specialized retailers operate through different kinds of retail channels. The main European food retail channels are hypermarkets, supermarkets, convenience stores, discount stores and cash & carry outlets. Hypermarkets, supermarkets and convenience stores can be defined regarding their size: hypermarkets are large stores ($\geq 2500\text{m}^2$), supermarkets are medium-sized stores ($400 - 2499\text{ m}^2$) and convenience stores are small supermarkets ($< 400\text{ m}^2$) (European Commission 2014a, 46). Discount stores compete with low cost market strategies and they typically provide limited assortments of products (European Commission 2014a, 23). Cash & carry outlets are large stores that usually require a membership. Their products are supplied in quantities and their cost saving strategies are often based partially on self-service. (Ahlert, Blut & Evanschitzky 2006, 290.)

Differences between retailers' strategies affect the format decisions. The market share of large retailers has seen extensive growth during the last decades and especially in Northern Europe the amount of specialized retailers has decreased significantly due the emergence of new store formats (Dobson et al. 2003; Eurostat 2011, 18, 85, 124). Non-specialized retailers and independent grocery stores have become rare in Northern Europe, whereas in Eastern Europe and in some Southern European countries they have remained prevalent (Eurostat 2011, 118). The leading European food retailers represent mainly supermarket, hypermarket and discount store formats. In the United States several convenience store chains can also be found among the leading retail companies. (Deloitte 2014.)

2.1.4 Current strategies and trends

As the European food retail sector has developed and become more convenient (Eurostat 2011, 116), new strategic approaches for attaining market share growth and new customer segments have emerged. Currently an increasing number of food retailers seek for growth opportunities in international markets. This has led to the arising of new trends, such as foreign investments, vertical integration and more frequent mergers and acquisitions.

The table below (table 1) presents a narrow selection of some trends and strategies that can be observed in the operational functions of the leading food retail companies. The table aims to provide an insight into the trends in the food retail sector applying an approach of strategic management. In order to detect whether some of these trends and strategies have been applied in the implementation of food waste initiatives, it is considered necessary to understand the broad field of the European food retail, including its current movement.

Table 1. Modern strategies and trends of food retailers (Compiled based on Bell, Davies & Howard 1997; Dobson et al. 2003, 124; Eurostat 2011; European Competition Network 2012, 44; FoodDrinkEurope 2013; Hansen 2013).

Trend	Description
Internationalization	Expansion from national markets to international markets
Concentration & consolidation	Few leading retailers cover a large share of the market
Mergers and acquisitions	1289 reported mergers in the European food sector since 2004
Vertical integration	Expansion of activities & strategic alliances e.g. in manufacturing or agriculture
New product lines	Growing share of private-label products, convenience
Activity in customer research	Use of customer surveys, loyalty cards
Technological advantages	Implementation of new systems, e.g. management of stocks
Innovative marketing	Use of social media and phone applications
Sustainability initiatives	Activity in organizational initiatives, implementation of responsibility activities

According to Hansen (2013, 302), “mergers, acquisitions and structural development are often not explicit goals as such, but are rather tools for achieving economic advantages.” Mergers and acquisitions can arise from the pressure of market concentration, but at the same time they can boost the trend of concentration. The trend of increased consolidation in the food industry is not a result of spontaneous acts (OECD 2014, 17); it results from a series of driving forces that can be guided by external or internal powers either actively or passively. (Hansen 2013, 302.) The growing share of private-label products is highly associated with concentrated

markets, whereas in markets where concentration is low (e.g. Italy) private-labels do not carry such significance over the market share (FoodDrinkEurope 2013, 13).

Innovations have the potential of bringing a lot of growth to the highly segmented European food markets (Fearne 1994, 30). New product lines are created and technological advantages are developed. Furthermore, market power is also being sought by collecting customer information that is used for focused marketing in traditional routes as well as through social media. Customer information can also benefit retailers and manufacturers who obtain information about consumers' purchase behavior. (Burt 1991; Bell, Davies & Howard 1997, 858–858; Hansen 2013, 79–80, 302, 346–347.)

2.2 Food waste issue

Food waste is often quantified by weight, sometimes including other units of measure such as caloric value, amount of greenhouse gases or lost inputs (Parfitt et al. 2010, 3066; Silvennoinen et al. 2011, 11). According to estimates, approximately one third of the food produced for human consumption gets lost or wasted every year, amounting to about 1.3 billion tons annually (Gustavsson et al. 2011; see also Vermeulen et al. 2012). Consumers in Europe and North-America waste per capita 95–115 kg of food per year, whereas in sub-Saharan Africa and South/Southeast Asia the amount is only 6–11 kg per year. It is estimated that the total amount of consumer food waste in Europe and North-America equals the total net food production in sub-Saharan Africa. (Gustavsson et al. 2011.)

FAO (2012, 11; 2013, 295) reports that in the industrialized world food waste occurs mainly at the very end of the FSC and it is dominated by consumer waste. Due to the waste created in retail and consumer levels, the amount of food that ends up consumed is significantly lower than what was produced (Lundqvist et al. 2008, 22). Perishable food items have been identified to be the most wasted food type (Parfitt et al. 2010, 3074).

In developing countries food waste mainly occurs in the first stages of the FSC, such as agricultural production, post-harvest handling, storage, preservation and process. Waste in developing countries occurs also due to lack of access to food. The role of retail and consumers

in the spoilage of food is not as remarkable as in middle- and high-income countries. (Gustavsson et al. 2011.)

2.2.1 Different types of food waste

WRAP categorizes food and drink waste created in households into three groups according to how avoidable the waste is. “Avoidable” waste is defined as waste which “at some point or prior to disposal was edible” referring to food products such as a piece of bread, fruit or meat. “Possibly avoidable” waste is described as waste which “some people eat, others do not” or that “can be eaten when a food is prepared in one way but not in another,” referring for example to bread crusts or potato skins. “Unavoidable” waste is defined as waste which “is not, and has not been, edible under normal circumstances.” It refers to food items arising from food or drink preparation, such as egg shells, bones or filtered coffee. (WRAP 2009.)

The classification of WRAP is applied in this paper in a wider context taking into account the entire FSC. Thus, it is considered that avoidable and possibly avoidable types of waste are produced by food products that would have been suitable for human consumption without further need of professional processing. Conversely, unavoidable food waste is considered as waste generated by items that are inadequate for human consumption, such as all animal by-products, filtered coffee, nutshells etc. A certain amount unavoidable food waste always occurs in the manufacturing of certain food items (Silvennoinen et al. 2012, 37).

Some of the unavoidable food waste could be utilized in food processing or for non-human purposes if it would be properly handled. As an example, edible tissue can be extracted from bones and processed into products, such as soup base or into hams and sausages (Ockerman & Hansen 2000, 241–244). Animal blood, which contains a significant amount of protein, is commonly discarded or not fully utilized. However, properly processed it could be used for the preparation of sausages or additives (Ockerman & Hansen 2000, 79–80). Also it is worth to notice that technical solutions during manufacturing can have an influence in the amount of unavoidable waste (Silvennoinen et al. 2012, 37). Accordingly, part of the food waste that is considered “unavoidable” possibly could be partly avoided and utilized if appropriate processing methods were applied.

2.2.2 Food waste treatment hierarchy

The waste legislation guidelines of the EU emphasize that waste should be treated with the following five-step waste management hierarchy: prevention, preparing for reuse, recycling, using for other recovery (such as energy) and, least preferably, disposing (European Commission 2010b, 4). UNEP (2014, 24) applies a similar hierarchy for food and beverage waste material. It emphasizes prevention as the most preferable option, followed by optimization, recycling, recovery and disposal being the last option (figure 2). As prevention and optimization aim to reduce the amount of food waste in the first place, they can be considered to be proactive means of waste treatment. In turn, recycling, recovery and disposal can be considered to be reactive actions as they do not directly aim to reduce waste.

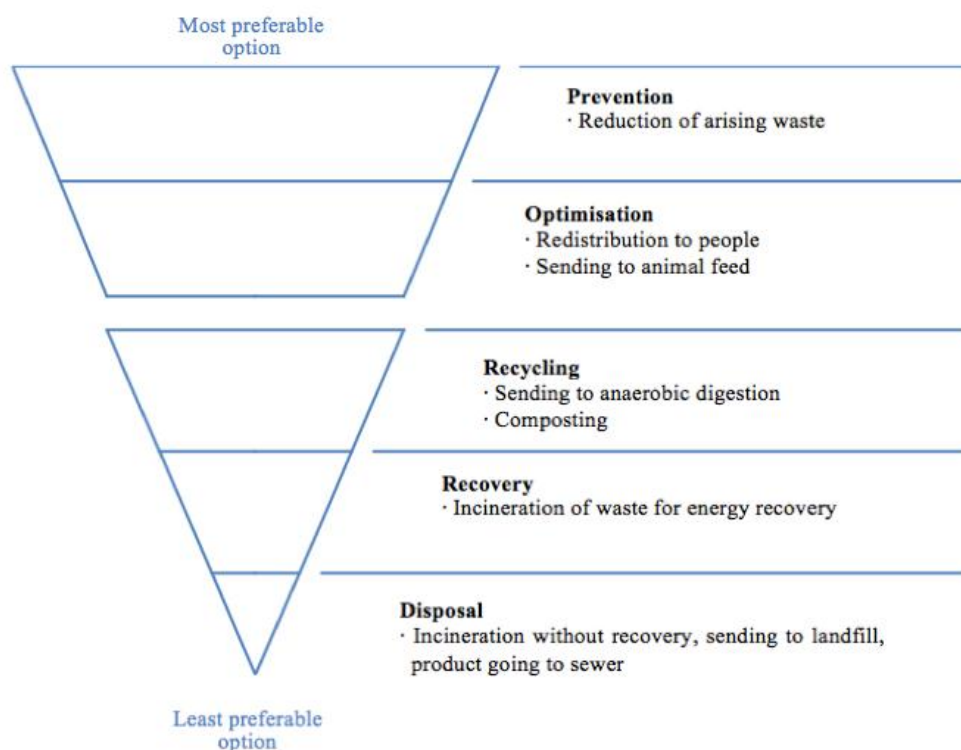


Figure 2. The waste hierarchy for food and beverages (Modified from UNEP 2014, 24) .

The processing of unwanted food into further products, using it for animal feed or biogas production are considered better options than disposal. The principle behind this statement is that resources would have been more wisely used if instead of wasting food it would have

been consumed or utilized for other purposes. (WRAP 2009, 92; UNEP 2014, 24.) The EU has set a target to achieve a 20 percent level of the overall energy consumption to be covered by renewable resources by the year 2020. Estimates suggest that two percent of this target could be reached if all organic waste would be converted into energy. (European Commission 2010b, 8.) However, using resources for animal feed or other purposes should not compete with human feed (Nellemann et al. 2009, 8; UNEP 2014, 24).

The European Commission emphasizes the importance of waste circulation and the use of waste as a resource. The improvement of waste management is seen to have potential to “open up new markets and jobs, as well as encourage less dependence on imports of raw materials and lower impacts on the environment” (European Commission 2011b, 8). The commission suggest that recycling and reusing waste – the three uppermost levels of the figure – should be prioritized in order to create a “full recycling economy.” This would involve all the operators along and around the FSC as well as policy makers. In addition, it would require investments in waste collection, waste treatment facilities and other incentives. (The European Commission 2011b, 7–8.)

2.2.3 Environmental, economic and social impacts of food waste

Food waste in medium- and high-income countries has multiple impacts. While in the developing world a reduction in food waste levels can rapidly yield results, such as improvements in incomes and food security (Gustavsson et al. 2011, 1), in medium- and high-income countries the impacts are more complex and challenging to notice in everyday life. Their identification requires a deep and wide analysis that addresses the surrounding environmental, economic and social environment. The identification of the impacts has to take into account all the stages of the FSC. Food waste occurring at one stage of the FSC can influence another stage or even the whole chain (Gustavsson et al. 2011, 15).

The environmental, economic and social dimensions are often tied together; they can co-exist in several kind of food wasting circumstances. As an example, inadequate processing at the beginning of the FSC can reduce the shelf life of products causing retail and consumer waste, which in turn create landfill emissions and losses of income. Conversely, edible agricultural products can be left to rot in the fields because of a retailer’s decision to lower its buying price

or dismiss a contract. This can affect the social surroundings, have an implication on the farmer's income and cause loss of environmental resources. (HLPE 2014, 3.)

The economic impacts of food waste are partly visible but they differ according to the operator (Lundqvist 2008). Food waste created in retail causes direct economic losses for the retail companies. However, the objectives of reducing food waste do not always collide with the economic priorities of companies which aim to maximize profits. There are targets for achieving low food waste levels, but the retailers' ambition to provide a wide selection of products to customers sometimes tends to surpass the objective of decreasing food waste levels. (Silvennoinen et al. 2012, 36.) The European Commission (2011b, 5) suggests that "changing the consumption patterns of private and public purchasers will help drive resource efficiency and can also generate direct net cost savings." Thus, changes in consumption patterns and a wiser use of resources could have beneficial economic and environmental impacts.

Food waste has negative impacts on the environment (Gustavsson et al. 2011, 1) as it increases greenhouse gases (WRAP 2009) and impacts hydrological systems (Lundqvist et al. 2008). Food waste does not only cause the loss of a visible food item – the production and delivery process of food uses resources along the whole FSC. Resources can include natural, labor and economic inputs. (Lundqvist et al. 2008.) When food is discarded, all the resources used for its production process are wasted.

The negative impacts of food waste on the environment do not end when a food item is discarded and its resources are splurged. Approximately 40 percent of the EU's organic waste ends up in landfills even when it would be better use as animal feed, a renewable source of energy or recycled compost (European Commission 2010b). Food waste that ends up in landfills creates methane emissions (Lundqvist et al. 2008, 26; Silvennoinen et al. 2012, 41) and thus contributes to the global warming (Lundqvist 2008, 26; WRAP 2009). In some countries legislation complicates or disallows the use of unwanted food as animal feed due to its risk for prion diseases (Godfray et al. 2010, 816).

The social impacts of food waste are notable too. Firstly, the reduction of food waste can have an effect on demand rates and thereby it can ease pressure from the supply if resources are available for alternative production (Lundqvist et al. 2008, 32; WRAP 2009, 75). Secondly, given that food is globally traded, a reduction in food waste could reduce global demand. A reduction in global demand can stimulate downward pressure on prices and allow greater availability of food in the developing world (WRAP 2009).

While analyzing the impacts of food waste on a global scale, it should be noticed that the field of international trade is complex. In order to derive arguments on the social and economic impacts of food waste and its reduction globally, all of the policies, such as free trade agreements and trade barriers, should be taken into account. Nevertheless, it is undeniable that food needs to be produced, traded and consumed more efficiently all over the globe to meet the future demand of a growing and urbanizing population (Lundqvist 2008, 5–6; Nelleman et al. 2009, 6–7; Gustavsson et al. 2011).

2.2.4 Causes and prevention of food waste

Food waste results from a variety of causes. The causes include technological factors, such as issues in packaging, production, storage and handling, but also personal factors, such as lack of awareness, personal preferences and absence of purchase planning. While most of the causes are typical for specific stages of the FSC, some of them are shared among two or more segments of the chain. The consequences of food waste are effects that emerge as results of its production. They can affect negatively the surrounding natural, social and economic environment.

Research suggests several means of waste prevention that concern various stakeholders, such as public entities, the civil society and the private sector. The means include the development of communications, knowledge, processes and systems, among others. In a strict definition of food waste prevention efforts such as “donations” or “alternative uses of food waste” are not considered as prevention, but as recycling. (Stenmarck et al. 2011, 17.) The main causes, consequences and means of prevention of food waste in the middle- and high-income countries are presented in the following table (table 2). The stage of the FSC in which the wasting occurs is presented in the left cell, followed by causes, consequences and means of prevention.

Table 2. Main causes and consequences of food waste and means for its prevention (Compiled based on Stuart 2009; Godfray et al. 2010; Parfitt et al. 2010; Gustavsson et al. 2011; Silvennoinen et al. 2012; European Commission 2014b; FoodDrinkEurope 2014a; FoodDrinkEurope 2014b; UNEP 2014).

Stage of the FSC	Cause	Consequence	Prevention
Agriculture	Overproduction	Crops are sold to processors or to be used as animal feed at a lower price	Communication and cooperation between farmers – allows surplus crops from one farm to solve a shortage of crops on another
	Premature harvesting	Food loses economic and nutritional value and can be wasted if not suitable for consumption	Training, education, diversification of production, organizing farmers
	Climate and environmental factors	Spoilage or unsafe food	Seasonal climatic forecasts
Agriculture & Manufacturing	Waste due to spillage and degradation during harvest, handling or transportation	Food becomes unsafe or its quality decreases	Developing operations in agricultural production and manufacturing
	Process interruptions or product and packaging damage	Food is lost due to damages that can affect shelf life, appearance or other factors	Developing agricultural processes and manufacturing
Manufacturing	Attitudes: “disposing is cheaper than using or re-using”	Food is lost rather than used or processed further; food is spoiled down the production line	Develop markets for “sup-standard” products; training and education
Manufacturing & Consumer	Oversized food packages	Food is purchased in excess over the amount that will be eaten	Changes in manufacturing; raising public awareness; providing a variety of package sizes
Agriculture, Manufacturing & Retail	High “appearance quality standards,” aesthetics	Products are rejected: food products aimed for human consumption are diverted food to animal feed, other uses or get wasted	Sales closer to consumers without having to pass the retailers’ quality standards; further processing of products; offering wider quality range of products; consumer surveys
Retail	Wide range of products / brands in display and supply	Products reach their expiration or “best before” dates before being sold; products close to expiration are ignored by consumers	Reduction of product ranges; reduction of prices of products close to expiration; extending shelf life through packaging and processing innovations; further processing of products close to expiration

Retail	Inaccurate order forecasting and management of stocks	Product supply and demand do not match; products expire before being purchased	Use of efficient forecasting, management systems and procedures; training and education; placing of the products in shelves; further processing of foods close to expiration
Retail & Consumer	Expiration, food not used in time	Food expires or gets rejected	Public awareness and education; further processing of foods close to expiration
	Marketing strategies such as “2 for 1” and “buy 1, get 1 free”	Retailers stock excessive amounts of products; food is purchased in excess	Abandonment of such marketing practices; public awareness and education
Consumer	Confusion about date label interpretation	Food is wasted because of confusion	Public awareness and education; provision of clear date labels
	Difficulty in removing food from package	Food cannot be removed from package and thus food cannot be fully utilized	Innovations and development of packages
	Lack of shopping planning	Excessive amount of food is purchased	Public awareness and education
	Errors in food preparation	Food is wasted due to dissatisfaction or inappropriate handling	Education; provision of recipes; training
Whole food chain	Inadequate storages; Ineffective storage systems	Food is wasted due to inappropriate procedures or conditions; shelf life reduces due to ineffective storing	Provision of clear storing instructions; improving logistics, cold-chain management and storage conditions
	Lack of information, abundance and attitudes	Food is purchased in excess; food is wasted due to abundance and attitudes	Training; public awareness and education; provision of recipes (for leftovers)
	Long distances between locations of production and consumption	Food is wasted because of transportation, quality and security issues	Enhancing efficiency along the chain; favor local products
	Failure in complying with regulations, standards and food safety	Unsafe food products are not processed and do not reach markets	Training and education
Whole food chain (excl. consumers)	Lack of cooperation within the FSC	Inefficient operational procedures	Increasing cooperation between the operators; training

3 Corporate social responsibility

Food waste initiatives implemented by retailers are considered as activities contributing to CSR. The core business of the leading European food retailers is in the sale of foods and beverages, but the retailers can incorporate responsibility actions in their strategies for different reasons. Some companies implement responsibility activities in order to produce beneficial outputs, others only do what is required by policies.

The European Commission (2011b) defines CSR as “a concept whereby companies integrate social and environmental concerns in their business operations and in their interaction with their stakeholders on a voluntary basis.” The ideology behind the Commission’s definition is based on the idea that policies and regulations should support the development of CSR, but that enterprises should have the flexibility to innovate and develop it according to their circumstances.

The theoretical background of this research is based on the concepts of CSR. The aim of the following sections is to gain an understanding of the broad field of CSR and its concepts, and furthermore relate to it in the context of the European food sector.

3.1 Background and concepts

An idea of firms having responsibilities towards the society beyond the responsibility of making profits for their shareholders has existed for centuries. However, CSR is a concept mainly created in the 20th century with notable development since the 1950’s. The development was strongly influenced by Howard Bowen’s (1953) book *Social Responsibilities of the Businessman*. (Garriga & Melé 2004, 51; Carroll 2009, 269–270; Carroll & Shabana 2010, 85–86.) Since the era, researchers have analyzed CSR with a wide range of approaches from supportive to critical (Okoye 2009; Carroll & Shabana 2010, 88–89). Various researchers, such as Davis (1960, 1967), Carrol (1979) and Freeman (1984), have presented theories of CSR related to corporate constitutionalism, stakeholder management, stakeholder normative theory and corporate social performance. A famous critical approach based on the maximization of shareholder value was presented by Milton Friedman (1970; ref. Garriga & Melé 2004, 53), who argued that “the only responsibility of business towards society is the

maximization of profits to the shareholders within the legal framework and the ethical custom of the country.”

Responsibility issues have remained a frequent topic of discussions over the years. Especially during the last few decades CSR has become an integral part of public debate and business practices. Starting from an inclination towards the appreciation of environmental responsibility, the responsibility actions incrementally developed towards broader concepts of sustainability management (Jamali 2006, 809). In the 1990's the concept of CSR was developed towards themes of corporate social performance, corporate citizenship and the Triple Bottom Line (TBL) (Elkington 1997; Carroll 1999; Jamali 2006). In addition, the relation between CSR and business performance has been a popular field of study among more recent research (see section 3.4).

Nowadays CSR has established a firm position in the fields of business and sustainability research. However, it still lacks a universal definition (Carroll & Shabana 2010, 89). CSR presents a wide assortment of theories, terminology and approaches (Garriga & Melé 2004; Okoye 2009). Votaw (1972, 25) summarized the broad concept of CSR stating that “corporate social responsibility means something, but not always the same thing to everybody.” The variety of CSR definitions includes concepts such as “corporate responsibility,” “corporate sustainability,” “business in society” and “corporate citizenship” (Garriga & Melé 2004; Halme & Laurila 2009, 327). The different theories vary from instrumental to political, ethical and to integrative with a variety of different approaches (Garriga & Melé 2004).

3.1.1 Private initiatives and public goals

A main characteristic of CSR is that it enhances the need for private initiatives that have public goals (Dubbink, Graafland & Liedekerke 2008, 391). The definition of Carroll (1979, 500) describes the most essential aim of CSR: “The social responsibility of business encompasses the economic, legal, ethical, and discretionary [refers to philanthropic] expectations that society has of organizations at a given point in time.” In other words, when businesses realize responsibility initiatives they have the objective of responding to the society's expectations.

All businesses must first of all fill their “required” responsibilities, which are economic and legal. Economic responsibilities refer to the requirement of producing goods or services and

yielding adequate returns to shareholders. Legal responsibilities refer to the requirements set by laws and policies. (Halme & Laurila 2009, 327; Carrol & Shabana 2010, 90.) Along with required responsibilities, businesses also have “expected” and “desired” responsibilities. Expected and desired responsibilities cover ethical and philanthropic responsibilities and reflect a link between businesses and the society. (Carrol & Shabana 2010, 90.)

Friedman (1962; ref. Carroll 1999, 277) did not agree with the idea that businesses should have public goals. His theory makes a clear separation between the responsibilities of the private and the public sectors. Friedman argued that the social responsibility of firms is to maximize the profits of the owners and shareholders within the law and ethical norms of the market economy. His instrumental point of view is that responsibility activities misuse resources that should be addressed to the owners and shareholders or to the improvement of core business practices in order to create wealth. According to Friedman’s point of view, it was the markets’ or the nations’ responsibility to address social problems, not the firms’. (Friedman 1970; ref. Garriga & Melé 2004, 53.)

Although Friedman’s argument has found some support from researchers (Wahba 2008, 91), his point of view has been widely criticized as such because of its enhanced instrumental approach. The responsibility of companies towards the society and the environment has been recognized (Davis 1960; Carroll 1991; Porter & van der Linde 1995) and nowadays corporate strategies are challenged to create sustainability activities that balance the requirements of economic market sustainability with social and environmental responsibility (Jamali 2006; Parnell 2008).

The stakeholder approach of CSR addresses the interest groups towards whom companies have responsibilities. Mitchell, Agle and Wood (1997, 855) define stakeholders as “persons, groups, neighborhoods, organizations, institutions, societies and even the natural environment,” referring to all the individuals and groups who can affect or are affected by the firm’s activities. The stakeholder theory states that the core component of the strategies of private companies is to create maximal profit taking into account the interests of all stakeholders. According to the approach, in order to be successful companies constantly seek

to implement strategies leading to the highest possible performance rate in a way that all the stakeholders are accommodated. (Freeman 1984, 53.)

3.1.2 Strategic business management or philanthropy?

The driving forces behind responsibility initiatives can vary greatly (Garriga & Melé 2004). The way companies implement responsibility programs can differ widely regarding the link between CSR, their chosen strategy and desired outcomes. If traditionally CSR has been seen as a passive philanthropist, such as in promoting charity activities, donations and sponsoring, currently its strategic role is being emphasized. (Maloni and Brown 2006; López et al. 2007, 296; Parnell 2008.) Recent research has paid intensified attention to the role of innovation and the win-win potential that can be achieved with CSR (Burke & Logsdon 1996; Margolis & Walsh 2003; Lankoski 2008b; Carroll & Shabana 2010). The European Commission (2011b, 3) suggests that “a strategic approach is increasingly important to the competitiveness of enterprises” because it leads to positive outcomes in risk management, cost savings, access to capital, customer relationships, human resource management and innovation capacity.

Researchers have identified the reasons behind companies’ motivations to invest in responsibility (Halme & Laurila 2009, 327). The motivations can vary from altruistic to utilitarian and to corporate citizenship. Altruism refers to general welfare and ethical behavior based on voluntary contribution, which may involve losses of profits. Utilitarianism refers to private wealth and a type of behavior, which has economic objectives. The ideology behind it is based on the argument that “costly responsibility actions should not be undertaken voluntarily.” (Windsor 2006.) Hence, the utilitarian approach can be linked to Friedman’s (1962, 1970) viewpoints. Corporate citizenship in turn “falls into the conceptual gap between ethical and economic perspectives” (Windsor 2006, 97) referring to a firm’s responsibility towards itself in respect to profitability, legal responsibilities, ethics and philanthropy (Carroll 2003, 1–2).

Halme and Laurila (2009) present three different types of CSR orientation: philanthropy, CSR integration and CSR innovation. They argue that a certain kind of orientation can influence the relationship between CSR activities and their financial and societal outcomes (figure 3).

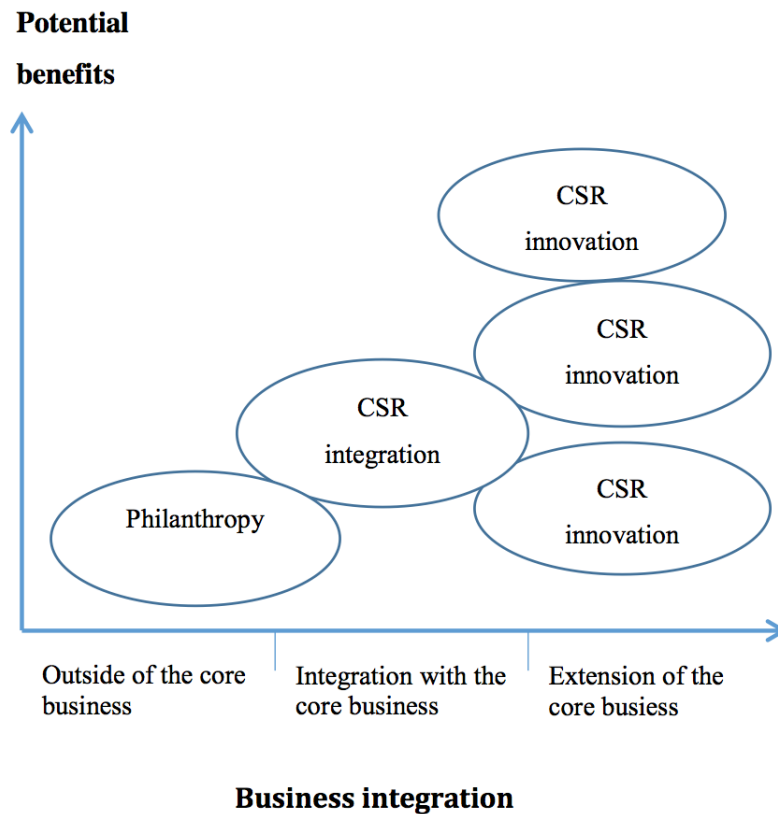


Figure 3. Level of business integration of CSR types and the potential for expected outputs (Halme & Laurila 2009, 334).

The focus of the theory is in the strategic integration of the enterprise in relation to its responsibility efforts considering that philanthropy is altruistic and not connected with the company's core business. The more the responsibility efforts are integrated with the core business, the more they create potential benefits. Although CSR innovations can create the highest potential benefits, their beneficial level can also remain low. A firm's potential to create positive financial and societal outcomes increases gradually as strategic integration or innovations are incorporated into CSR activities. (Halme & Laurila 2009.) The potential of innovations as a key to achieving positive outcomes, improvement and profits has been also emphasized in other researches (Asongu 2007; Lankoski 2008b, 543; Wahba 2008, 96; Kim et al. 2014).

3.2 Triple Bottom Line

The TBL approach developed by John Elkington (1997) suggests that CSR can be divided in economic, environmental and social dimensions. The principle of the model is that the social dimension is dependent on the economic dimension, which in turn is dependent on the environmental dimension – the well-being of the global ecosystem. Enterprises should have an objective to balance and manage the three dimensions (Jamali 2006) and include them into their core values (Sridhar & Jones 2012, 99).

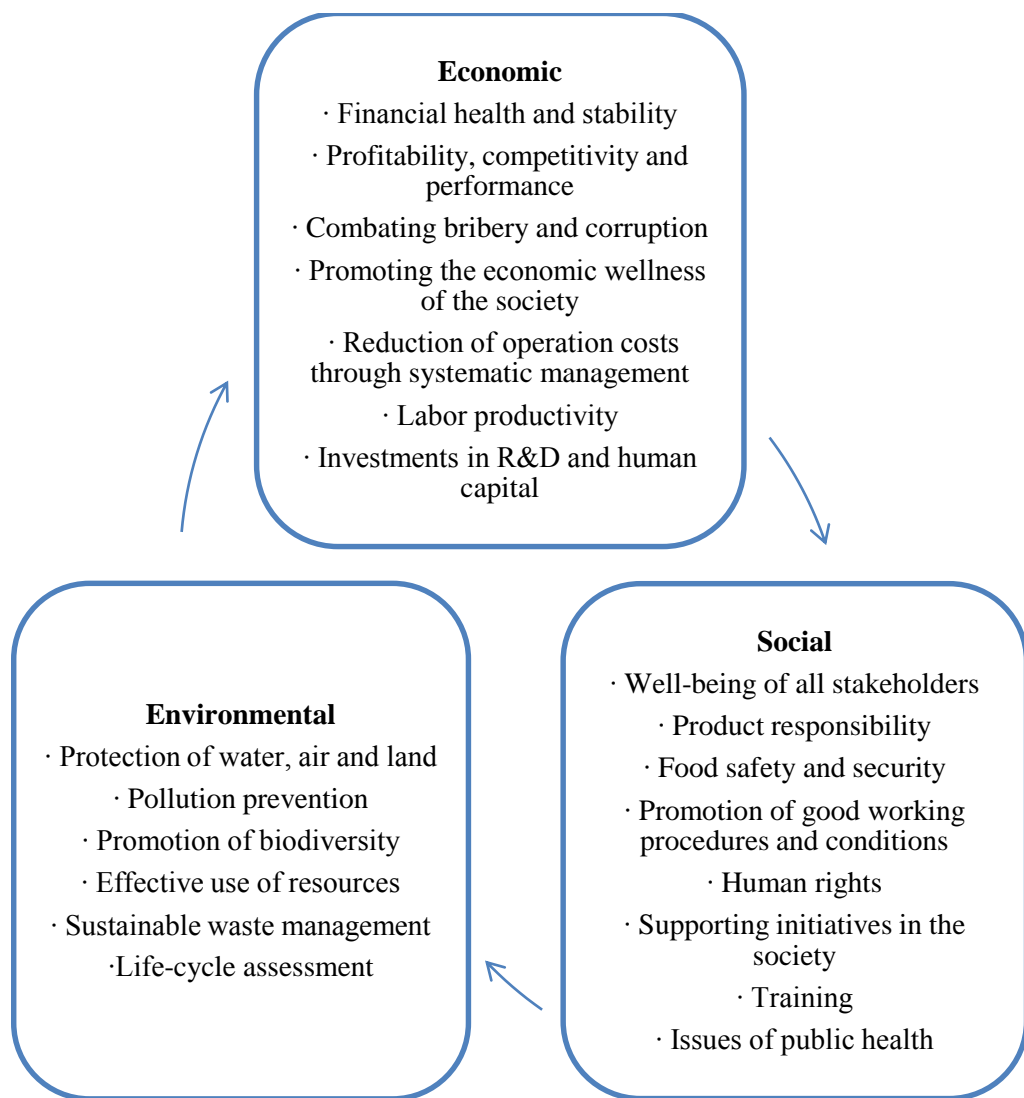


Figure 4. The dimensions of the TBL (Compiled based on Jamali 2006; Lankoski 2008a; Niskala, Pajunen, & Tarna-Mani 2009, 20; GRI 2011, 25–39; European Commission 2011a, 7).

It has to be considered that an absolute division of responsibility activities according to the dimensions of the TBL is often difficult as the responsibility activities tend to encompass several of the aspects. Each of the three dimensions can be divided further into more specific divisions. The three dimensions of the TBL approach and their specifications are presented in figure 4.

Economic dimension

The economic dimension of CSR is the basis of the operative functions of enterprises. It covers the socio-economic and financial aspects of responsibility. (Dahlsrud 2008, 4.) Financial health and stability are needed for the execution of sustainable long-term operations. A firm's first concern must be its survival and sufficient economic results are needed for viability (López et al. 2007, 287). In addition, the dimension includes aspects related to employment, competitiveness and market creation (Jamali 2006, 811). The economic dimension covers all of the organizations' impacts on all levels of the business environment: the local, national and global (GRI 2011, 25).

The Global Reporting Initiative (GRI) distinguishes three aspects in the economic dimension: economic performance, market presence and indirect economic impacts (GRI 2011, 25). The economic performance refers to a company's abilities to fulfill the stakeholders' expectations including all operational costs and profitability. The market presence refers to competitive factors. The indirect economic impacts reflect to the society and its well-being.

Environmental dimension

The environmental dimension of CSR refers to ecological responsibility issues that cover the whole natural environment, including living and non-living natural systems (Jamali 2006, 812; Dahlsrud 2008, 4; GRI 2011, 27). It emphasizes a sustainable approach in all processes and it "involves more than compliance with all applicable government regulations or even initiatives such as recycling or energy efficiency" (Jamali 2006, 812). The effective use of resources, waste issues and greenhouse gas emissions are in the core of the environmental dimension.

Social dimension

The social dimension of CSR describes the relationship between businesses and the society (Dahlsrud 2008, 4). It broadly considers and balances the expectations of different

stakeholders (Jamali 2006, 812) as all activities can generate different kind of outputs with direct or indirect effects to the society (Niskala et al. 2009, 19–20). In the food industry the social dimension is emphasized especially in relation with food security and food safety issues. Also labor conditions, education, human rights, working conditions and effects to public health, among others, are included in the social dimension (Jamali 2006, 812).

The principles of the TBL have been institutionalized to a high extent as a manner to address corporate sustainability (Sridhar & Jones 2012). However, the TBL approach has been criticized by some researchers (Norman & MacDonald 2004; Gibson 2006; Sridhar & Jones 2012) for its difficulty to be measured and for its lack of integration between the three dimensions. When the dimensions of the approach are dealt with separately, their later integration can be difficult (Gibson 2006; see also Jamali 2006). Sridhar and Jones (2012, 98) argue that “the TBL focuses on the co-existence of the three bottom lines but does not show their interdependence.”

Unlike the economic dimension, the environmental and social dimensions lack common tangible measurement units or methods, and thus they are often difficult to assess. This leads to a problem of reliability in reporting (Sridhar & Jones 2012, 106). As common rules do not exist, firms can choose to report only about topics that are beneficial to them and ignore topics that could harm their reputation. Partly this has led to the creation of reporting guidelines and quality assurance systems often based on the principles of the TBL approach, presented in the following sections.

3.3 Reporting practices

As communication between different stakeholders has risen, companies seek more actively to disclose their sustainability commitments towards the public (Reynolds & Yuthas 2008, 50). As business gains more visibility, it is bound to pay increasing attention to follow the implications of the operations and to update stakeholders – financial reports are not enough to satisfy the craving for information of all stakeholders (Jamali 2006, 810–811; Dubbink et al. 2008, 392).

The rising public scrutiny has led to greater involvement towards CSR efforts and reporting (Kolk 2003, 279–280; Hartmann 2011, 310–312). While small and medium-sized enterprises

are often relatively active in adopting CSR programs, large companies nowadays tend to report more actively and systematically about their responsibility measures (Kolk 2003, 289; Jones, et al. 2005; Hartmann 2011, 310–312). Leading, often multinational, companies have pressure to act responsibly due to their impact on the society and environment (Enderle 2004, 51). They are often considered to be the key players in the economic globalization and thus being accountable for their impacts (Hartmann 2011, 310).

Reporting practices tend to be unsystematic and reports are often incomparable (Gray, Kouhy & Lavers 1995, 47; Dubbink et al. 2008, 401; Reynolds & Yuthas 2008, 50; see also Jones et al. 2005, 891). CSR efforts can be communicated by the corporation itself or by a third party. The information can be included in the CSR or annual report or it can be communicated in other ways through public or private communication sources. The information content tends to vary from financial to non-financial information and from quantitative to qualitative information. Reports are not always reliable – they can represent untruthful information (Reynolds & Yuthas 2008, 55).

To improve reporting researchers call for more regularity (Reynolds & Yuthas 2008, 50; Stenmarck et al. 2011, 45), long-term evaluation of impacts (Jamali 2006, 813) and transparency (Elkington 1997; Dubbink et al. 2008; Reynolds & Yuthas 2008). Elkington (1997) suggests the measurement of progress and the use of sustainability audits being crucial for the development of transparency. Furthermore, Reynolds and Yuthas (2008) enhance accountability reporting in CSR.

3.3.1 Guidelines and quality assurance systems

Organizations have responded to the need for improvement in CSR reporting by providing common guidelines. Their aim is to make reporting more uniform and reliable. Some commonly used guidelines are GRI (Global Reporting Initiative), EMAS (Eco-Management and Audit Scheme), the UN's Global Compact agreement and the Foreign Trade Association's BSCI (Business Social Compliance Initiative) and BEPI (Business Environmental Performance Initiative). Other guidelines, such as the Dow Jones Sustainability Index, ISEA (Institution and Ethical AccountAbility), AA1000 (International Accountability Assurance Reporting Standard) and CEPAA (Council on Economic Priorities Accreditation Agency) also

offer guidelines for reporting. (Jamali 2006; López et al. 2007; Dubbink et al. 2008, 396; Reynolds & Yuthas 2008, 50.)

GRI is a non-profit organization that functions in cooperation with the UN. It provides guiding and support to organizations with the objective of making sustainability reporting a standard practice (GRI 2011). GRI includes social, environmental and ethical aspects (Jamali 2006, 811). EMAS is an environmental management scheme set by the European Commission. Its aim is to promote environmental participation and transparency to improve the environmental performance of enterprises. It is a voluntary tool that requires the use of the ISO 14001 environmental management certification. (Reynolds & Yuthas 2008, 50–53.) The UN's Global Compact Agreement is an initiative that promotes “ten universally accepted principles” in the fields of human rights, environment, anti-corruption and labor and works towards sustainability. Its members must commit to incorporate the ten principles in their strategic management and publish a public disclosure to stakeholders. (UN Global Compact 2014.) BSCI and BEPI are business-driven services with a supply chain approach. BSCI focuses on transparency and working conditions in the global supply chain and BEPI concentrates on environmental performance enhancing development, economic growth and prosperity. (BSCI 2014; BEPI 2014.)

As reported by the European Commission (2011b, 4–5), the recent years have shown a rise in voluntary CSR reporting. Between the years 2006 and 2011 the amount of EU companies taking part to the UN's Global Compact agreement rose from 600 to 1900 and the amount of European companies publishing sustainability reports that comply with the GRI guidelines rose from 270 to 850. In addition, the amount of companies registered in the EMAS audit program increased from 3300 to over 4600.

A recent trend observed among companies is the growing use of quality assurance systems or third party certifiers. Traditionally government agencies were responsible for the monitoring of food safety and quality issues. However, as the agro-food system has become global and cross-continental food chains have emerged, third party certifiers and quality assurance systems have taken part in the monitoring task. The certifiers can be either private or public, and their certificates provide information about products and production processes for

stakeholders. Certificates can cover anything from systems, processes and products. They can include standards for food quality, agricultural practices or environmental aspects. Certification and quality assurance systems can be keys for enterprises to grow their competitive capacity. (Hatanaka et al. 2005, 355; Trienekens & Zuurbier 2008.)

3.3.2 European reporting policies

The EU legislation together with national legislations forms the legislative dimension of the required responsibilities (Carrol & Shabana 2010, 90) European organizations must follow. Currently only financial reporting is compulsory among the large companies that employ over 500 workers. Non-financial reporting is voluntary on the EU legislation's level. (Reynolds & Yuthas 2008, 48; European Commission 2011a.)

The latest updates in the EU's CSR strategy were published in 2011 and they are to be applied until the end of 2014 (European Commission 2011a). In early 2013 the European Commission (2013b) proposed that large companies would be required to include non-financial information related to environmental and social responsibility in their annual reports. In 2014 the European Parliament and the European Council adopted the directive (European Commission 2014c). The new directive requires all large companies to report widely on CSR issues starting 2017 (European Commission 2014c). This development fills the need to establish more requirements for reporting about food waste reduction activities proposed earlier in the food waste report of the Nordic Council of Ministers (Stenmarck et al. 2011, 35).

Currently the EU's legislation offers guidelines and dictates requirements for the food sector. The objective of the EU's food legislation is "the provision of safe, nutritious, high quality and affordable food for Europe's consumers" (European Commission 2013a, 3). Besides the European legislative framework specializing in food, the industry must follow, among others, trade and environmental legislations regarding international agreements and standards, environmental protection and sustainability. (European Commission 2013a, 6.)

The environmental legislation was set up in 1973 in order to protect the natural environment and it includes guidelines on waste disposal issues. The aim of the environmental policies is to "move towards a more resource-efficient society." The objective of the waste legislation is to reduce waste and promote re-use and recycling, leaving discarding as the last option.

(European Commission 2010c.) The environment legislation provides guidelines for food waste disposal, but it does not require retailers to manage their food waste in any specific way.

3.4 Corporate social responsibility and performance

Managers constantly have to face situations where scarce corporate resources must be wisely allocated in an unpredictable environment. Decisions, however, do not only concern resources – they can influence also the way firms respond stakeholder expectations. (Waddock & Graves 1997, 4.) Regardless whether companies undertake responsibility dimensions for strategic or altruistic reasons and whether they concern economic, environmental or social dimensions, it is still unclear in what extent responsibility “pays off” (Burke & Logdson 1996).

Although CSR has been under research for years, no common agreement about the measurement of its outputs has been achieved. While some research focus into the examination of a correlation between CSR and financial performance, others aim to define the creation of non-financial outputs (Burke & Logdson 1996; Wagner & Schaltegger 2004; Lankoski 2007; Lankoski 2008a, Wahba 2007). Although this research focuses on non-financial outputs, also the concepts of corporate financial performance are briefly presented further.

3.4.1 Corporate financial performance

The correlation between CSR and financial performance has been studied by several scientists since the 1970's. A constant debate surrounds corporate financial performance as the topic still remains a confusing issue in the literature (Porter & van der Linde, 1995; Moore 2001; Aragón-Correa & Sharma 2003; Hillman & Keim 2003; Lankoski 2007; Lankoski 2008a; Wahba 2008; Halme & Laurila 2009).

The results of the researches that aim to discover links between CSR and financial performance have been contradictory: some have found positive correlation, some negative correlation and some no correlation at all (Spicer 1978; Jaggi and Freeman 1992; Waddock & Graves 1997; Margolis & Walsh 2003; Orlitzky, Schmidt & Rynes 2003; Mill 2006; López et al. 2007). No determinate link between CSR and financial performance can be unanimously proven. Lankoski (2008a, 34–36) argues that some of the studies do conclude either a slightly positive correlation or a non-negative correlation – the positive effects are never automatic and even in situations where responsibility does not lead to better economic performance,

irresponsibility can decrease it. Halme and Laurila (2009), for their part, point out that two recent studies provide some evidence of a positive relationship between CSR and financial performance.

3.4.2 Corporate responsibility outputs

Research suggests that CSR can provide different non-financial strategic benefits (Burke & Logsdon 1996, 495). Burke and Logsdon (1996, 495) argue that understanding the strategic implications of CSR efforts is important for managers “because without a clearcut understanding of strategic benefits that may accrue to the organization, it is more likely that top management will not invest in CSR practices which contribute to the long-term success of the firm.” Lankoski (2008b) distinguishes CSR efforts in relation with the different outputs they potentially create. The three different kind of outputs that can be produced are learning, reputation and CSR outcomes. According to the approach, all CSR activities are expected to produce one or more of these three outputs.

Learning

Learning in the context of the outputs of CSR refers to organizational learning. It occurs when the “range of potential behaviors by the organization is changed through the acquisition, distribution or interpretation of information” (Huber 1991; ref. Lankoski 2008b, 538). Organizational learning is suggested to enhance several capacities that are crucial for success and Jamali (2006, 813) states that “learning at the organizational level involves creating systems/processes, which put in place long-term capacities to capture knowledge, to support knowledge creation and to empower continuous transformation.”

CSR can contribute with learning through different means. First of all, the quality and flow of information that a company has relating to stakeholder expectations can be improved. Through the implementation of CSR programs a company can understand the potential of effective alternative solutions that could have an impact on the responsibility issues. In addition, learning can lead to the improvement of coordination capabilities and the interpretation and integration of information related to CSR. (Lankoski 2008b, 538.) A company that has implemented CSR initiatives can furthermore achieve learning through the development of increased expertise, awareness, resources and capabilities (Aragón-Correa & Sharma 2003; Hillman & Keim 2003; Orlitzky et al. 2003).

Learning can be divided into intentional and unintentional sections. Intentional learning refers to a situation where the goal of gaining increased expertise, awareness, resources or capabilities has been set as an initial mission of the implementation of the responsibility activity. (Lankoski 2008b, 538.) Unintentional learning on the other hand refers to processes that do not have the initial goal of learning, but where current practices end up being re-examined and new intelligence is obtained (Esty & Porter 1998; ref. Lankoski 2008b, 538).

A distinction can be made also between regular learning and innovative learning. Learning is regular when an organization obtains some kind of information or abilities from the surrounding environment that have not yet been applied in the company. In turn, learning is innovative when an organization succeeds in developing something unprecedented that no-one has ever created before. (Lankoski 2008b, 538.)

Reputation

Reputation refers to the “image that stakeholders have of the firm and its CSR outcomes” (Lankoski 2008b, 538). As reputation can be based on actual responsibility outcomes or based on information, it can be valid or false. Information alone does not ensure that any actual outcomes have been achieved. As reputation does not automatically have any authentic basis, an organization can attain positive reputation out of outcomes that do not exist. Both external and internal sources can communicate reputation related information about the outcomes of a company’s responsibility activities. (Lankoski 2008b, 538.)

CSR outcomes

The concept of corporate social performance (CSP) links CSR with the outcomes it creates. Wood (1991, 693) defines CSP as “a business organization’s configuration of principles of social responsibility, processes of social responsiveness, and policies, programs, and observable outcomes as they relate to the firm’s societal relationships.” CSR outcomes in the model of Lankoski (2008b, 538) refer to “improvements in the social or environmental impacts of the firm.”

Food waste programs can produce CSR outcomes. Developing efficient stock management systems can lead to the reduction of expired products and less waste. Increasing the awareness of consumers through information sharing can lead to positive changes in consumption habits.

However, there may be responsibility activities that are considered successful by stakeholders that do not produce any CSR outcomes. Only the kind of responsibility practices that produce CSR outcomes are defined as effective. (Lankoski 2008b, 538–539.)

CSR outcomes can be divided in two categories based on information transmission. Observable outcomes are the kind of outcomes that are transmitted to stakeholders either by direct experience or the transmission of information related to the CSR outcomes in interaction with the company. Conversely, the kind of outcomes that are not directly experienced by the stakeholders are referred as unobservable. If stakeholders somehow receive information about the CSR outcomes, unobservable outcomes can become observable. The distinction varies between the stakeholders in relation to their link to the company. (Lankoski 2008b, 538–539.) As an example, a food retailer company's staff may be aware of the reduction of in-store food waste as a result of improvements in stock management. However, if this is not communicated to the customers, they may remain unconscious about the CSR outcomes. Thus, the outcomes that are observable for the staff can remain unobservable for the customers.

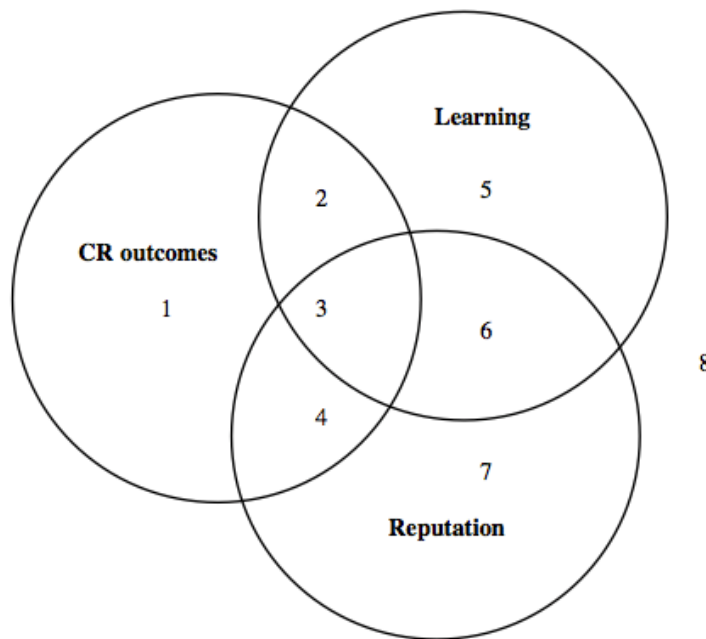


Figure 5. The classification of CSR outputs (Lankoski 2008b, 539).

The combination of outputs created by CSR efforts can be examined by analyzing the responsibility initiatives. Different initiatives can be classified according to the outputs that they produce. The model for the classification is presented in figure 5.

The numbers from 1–8 present the combinations of different outputs. Numbers 1, 5 and 7 represent single outputs, numbers 2, 4 and 6 represent double outputs and number 3 represents a situation where learning, reputation and CSR outcomes are simultaneously produced. The number 8 represents failed CSR efforts that produce no outputs.

The theory of CSR outputs argues that responsibility programs can produce cost and revenue impacts regardless of whether any outputs are produced. The CSR practices of class 1 are considered effective as they produce CSR outcomes. Such practices that belong to classes 5 to 7 improve efficiency by producing learning or reputation. Activities of classes 2 to 4 are effective and improve efficiency. (Lankoski 2008b, 540–541.)

4 Theoretical framework of the paper

The theoretical framework (figure 6) has been assembled with the theoretical concepts that were considered essential for the successful implementation of this research. The research problem is presented in a circle in the middle of the theoretical framework. The objective is to examine what kind of food waste initiatives the European retailers have implemented during the last years. The purpose of the theoretical framework is to summarize the most essential approaches in order to connect the theoretical part of the paper with the empirical part.

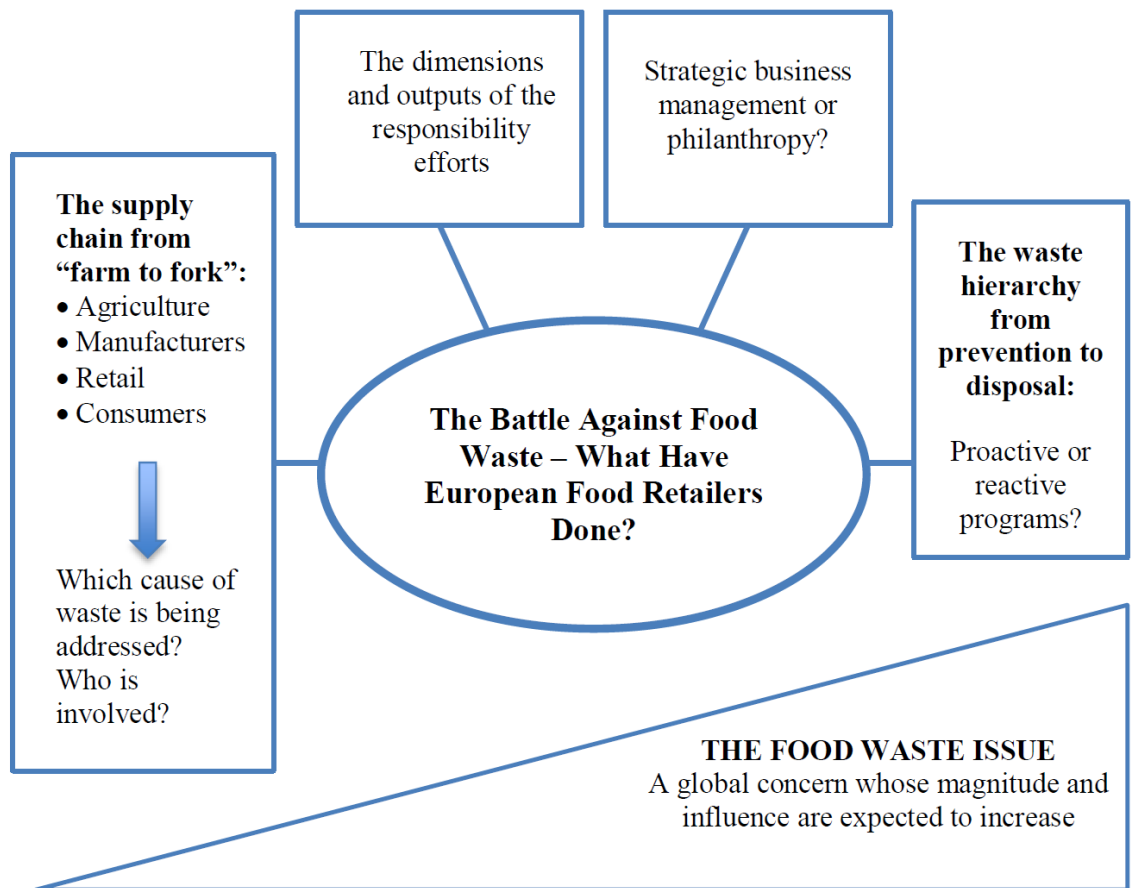


Figure 6. The theoretical framework of the paper.

The central concepts of this deductive research are placed around the research problem. The existence of a problematic food waste issue that outlines the entire context is the motive for the research, and thus it forms the base of the framework. The problematic food waste issue is presented in the shape of a triangle to reflect the increasing influence of food waste in the future.

As the European FSC presents some unique characteristics, an understanding of its structure is necessary for the execution and comprehension of this research. Food retailers were chosen as the target group for this research among all of the other operators of the food sector partly because of their influence in the FSC (Hansen 2013). The concepts of the FSC from “farm to fork” were essential in the process of identifying the causes and means of prevention of food waste. In the empirical part the responsibility efforts of the retailers will be examined with respect to the causes of waste that they address and the stage of the FSC they concern. The characteristics of the food waste programs are examined also by defining whether they are proactive or reactive.

In order to answer the research questions from a broad perspective, the retailers’ food waste efforts will be examined regarding the responsibility dimensions they represent and the outputs they produce. Furthermore, the food waste programs will be analyzed in relation to the level of their strategic integration in order to understand how well they are incorporated with the retailers’ core business.

5 Research methods

In this research the characteristics of European retailers' food waste practices are investigated empirically using the method of a qualitative content analysis. A qualitative content analysis method was chosen because it is able to provide a holistic and profound description of the variety of the retailers' food waste initiatives and their outcomes. The method contributes to the accomplishment of the objectives of the research since it allows the collection of information in a compact, yet descriptive way from a rather naturalistic paradigm (Grönfors 1982, 161; Hsieh & Shannon 2005, 1278; Elo & Kyngäs 2007).

This chapter provides an overview of the methods applied in this paper. The following sections present the concepts of content analysis and the phases of the research. Furthermore, the target group is presented and the information obtained is described.

5.1 Content analysis

Content analysis is a research method that can be used in the analysis of written, verbal, visual or communicative data (Krippendorff, 1980; Cole 1988; Weber 1990, 9–10). It is a flexible method for analyzing data in a systematic and objective way (Krippendorff 1980; Kyngäs & Vanhanen 1999). The aim of content analysis is to attain “a condensed and broad description of the phenomenon” (Elo & Kyngäs 2007) through a systematic examination of the material (Mayring 2004, 266–268).

The roots of content analysis date back in to the 19th century. Nowadays it is widely used in a variety of fields, such as business, communication, psychology and sociology. The use of content analysis as a research method has been steadily growing. (Neuendorf 2002, 27–30; see also Hsieh & Shannon 2005, 1277.) The method is considered appropriate even in situations dealing with unstructured data (Tuomi & Sarajärvi 2002, 105), as it permits the researcher to gain a comprehension about the field of research in a compact and general mode (Grönfors 1982, 161).

Content analysis can be roughly divided into quantitative and qualitative methods (Tuomi & Sarajärvi 2002, 95–97, 107–108; Elo & Kyngäs 2007). In the quantitative method, documents are analyzed so that their content is described with quantitative parameters. In qualitative analysis, which is the method applied in this paper, the content is described verbally and data is not quantified. (Tuomi & Sarajärvi 2002, 107–108.) In the analysis of verbal data, the qualitative method gives attention to the content or the contextual meaning of the text. The qualitative method permits the registration of descriptive notes and new information. (Hsieh & Shannon 2005.)

The qualitative and quantitative methods can apply approaches of induction, deduction or abduction (Tuomi & Sarajärvi 2002, 95–97, 107–108; Elo & Kyngäs 2007). Induction aims to derive conclusions from specific observations to a broader generalization. Deduction, conversely, goes from the general to the more specific. (Grönfors 1988, 27–33; Tuomi & Sarajärvi 2002, 95–97.) Hence, deductive research is based on theoretical knowledge. The process of deductive content analysis commences with the formation of a theoretical framework and is followed by the gathering of empirical material. Finally, the examination is done determining whether the theory can be applied to specific observations. (Grönfors 1988, 27–33; Hyde 2000.) The third approach, abduction, lays somewhere between the concepts of induction and deduction. Abduction considers that new scientific findings can only be created in circumstances where a guiding principle is leading the observation process (Grönfors 1988, 17–18).

Hsieh and Shannon (2005) argue that qualitative content analysis presents three different approaches: conventional, directed and summative. While the conventional analysis starts from observation, the summative approach starts with the identification of keywords. The directed approach starts with a deductive process – the review of existing theory. This permits the researcher to attain comprehension about the theoretical field and the key concepts of the research. The directed approach aims to develop coding schemes or categories derived from theory in order to further classify the data. The researcher can derive initial categories based on the theory and, within the course of the empirical research, can further modify them in relation with the data. (Hsieh & Shannon 2005.) This process of defining the key words and deriving initial categories can be referred to as clustering, grouping, conceptualizing or

theming – at the end they all refer to the aim of organizing a wide amount of data (Miles, Huberman & Saldaña 2013, 279–280).

This research applies a qualitative content analysis method from a deductive point of view. The approach of the research is directed. The material consists mainly of text data, which was analyzed in a systematic way. The following sections present the methods applied in this research in a more specific way.

5.2 Phases of the research

The research was conducted in various phases. It started with a familiarization to the fields of the theoretical framework. This was followed by the empirical part that began with the formation of a structured theory-based scheme and was then followed by the identification of the target group, the European large food retailers that have realized food waste programs. Following these steps, data was collected from the publications issued by the target group members. The data was then organized in accordance with corresponding themes. Eventually, an analysis of the data carried out the empirical part of the research.

5.2.1 Assembling the theoretical framework

The research began with a literature review and the formation of a theoretical framework which underlines this research. It includes the relevant theoretical fields and key concepts that were used as a starting point to conduct the research from a deductive point of view. It consists of the different fields of CSR as well as the concepts and background related to the European retail sector and the food waste issue.

As an integral part of the literature review, the causes of food waste and means of prevention were mapped and listed according to their stage in the FSC (see table 2). The identification of the causes of food waste was a tool to gain comprehension about the complexity of the food waste issue. The causes of food waste that retailers' efforts aim to combat were used as key concepts to derive categories in order to further organize data. The key concepts are tools that were used to identify which ways the food waste issue has been confronted by retailers. The categorization of food waste practices in accordance with specific causes revealed not only the cause(s) of waste that each initiative addresses, but also the stage of the FSC that is in the core of the initiative and the means of prevention that are being applied.

5.2.2 Compiling the theory-based scheme

Following the literature review, a structured theory-based scheme emphasizing the research questions and objectives was composed (Appendix 1). The objective of the scheme is to provide a structured matrix that helps the researcher register condensed data and references. It increases the reliability of the research, as the data is preserved and available for reanalysis (Miles et al. 2013, 311–312).

The scheme was divided into three sections: basic features, responsibility dimensions and CSR outputs. The section of basic features includes general information about the food waste initiative, such as a brief description of the retailer, the primary goals and achievements of the initiative and a condensed description of the activities (For an example, see Appendix 2). The key concepts that were used to further classify the CSR programs in themes are analyzed in this section. The section of responsibility dimensions includes an examination of the three dimensions of the TBL approach. Its aim is to provide information about the orientation of each initiative and to clarify whether the focus is on economic, environmental or social aspects, or whether it balances with the three dimensions. The section of CSR outputs aims to identify the achievements of the initiatives by classifying the potential outputs. Its aim is to define such outputs that have potentially been gained with the implementation of food waste programs. It should be noticed that reputation was examined exclusively from an internal point of view due to the research method chosen.

5.2.3 Identifying the target group

Among the operators of the FSC and the variety of middle- and high-income countries, European food retailers were chosen as the target group of this paper due to the following reasons. First of all, the retailer sector is an affluent link in the FSC (Hansen 2013) and the food industry's importance in European social and economic contexts is broad (see section 2.1). The retail sector itself is considered as “the core of the innovation chain” because it plays a key role in sustainability promotion (European Commission 2013b), which makes it an intriguing field for research. Secondly, geographical factors and European food production patterns as well as the common guidelines and policies of the EU (European Commission 2011a) were considered to be factors supporting the vision of concentrating on a specific geographical food market sector. In addition, as the European retail development presents a highly complex situation (Poole et al. 2002), it was considered justifiable to concentrate on a

specific geographical market in order to gain a deep understanding of the market the factors related to it. This research concentrates on leading food retailers because of their activity in CSR and reporting (Hartmann 2011, 310–312). The availability of information, the efforts in sustainability practices and strategic coherence of some extent were considered crucial for the implementation of this research.

Table 3. The target group of the research (Deloitte 2014).

Retailer	Country of origin	Revenue (US\$m)	Operational format	Countries of operation
Tesco PLC	UK	101269	Supermarket / Hypermarket	13
Carrefour	France	98757	Supermarket / Hypermarket	31
Schwarz Unternehmens Treuhand KG	Germany	87236	Discount store	26
Metro AG	Germany	85832	Cash & Carry	32
ALDI Einkauf	Germany	73035	Discount store	17
Groupe Auchan SA	France	59041	Supermarket / Hypermarket	15
Casino Guichard-Perrachon S.A.	France	57372	Supermarket / Hypermarket	26
Rewe Combine	Germany	48984	Supermarket	11
Koninklijke Ahold	Netherlands	42236	Supermarket	12
J Sainsbury PLC	UK	36840	Supermarket / Hypermarket	1
Intermarché	France	35753	Supermarket	8
Delhaize Group	Belgium	29242	Supermarket	8
Morrison Supermarkets	UK	28790	Supermarket	11
Migros Genossenschaft	Switzerland	24332	Hypermarket	3
Mercadona S.A.	Spain	22536	Supermarket	1
Coop Group	Switzerland	19000	Supermarket / hypermarket	5
Coop Italia	Italy	15279	Supermarket / hypermarket	1
ICA Gruppen	Sweden	14019	Supermarket	5
Jeronimo Martins	Portugal	13979	Discount store	2
John Lewis Partnership	UK	13454	Supermarket	3

Co-operative Group Ltd.	UK	13139	Supermarket	1
DIA S.A.	Spain	13021	Discount store	7
Louis Delhaize	Belgium	12861	Hypermarket	6
S Group	Finland	12508	Supermarket / Hypermarket	5
Spar Österreichische Warenhandels-AG	Austria	12498	Supermarket	8
Dansk Supermarked	Denmark	9406	Discount store	4
Kesko Corporation	Finland	9152	Supermarket / Hypermarket	8
Jumbo Groep Holding B.V.	Netherlands	8950	Supermarket	1
Colruyt Group	Belgium	8129	Supermarket	1
Grupo Eroski	Spain	7783	Supermarket	2
Reitan Group	Norway	7695	Discount store	7
Coop Danmark A/S	Denmark	6757	Supermarket	1
Sonae, SGPS, SA	Portugal	5737	Supermarket	10
Coop Norge	Norway	5278	Supermarket / hypermarket	1
KF Gruppen	Sweden	5241	Supermarket / hypermarket	1
Iceland Foods Group Limited	UK	4173	Supermarket	6
Agrokor d.d.	Croatia	3878	Supermarket	3

Deloitte's "Top 250 Global Retailers 2012" report (2014) was used as a primary source for the comprehensive selection of leading European food retailers in defining the members of the target group of the research. The listing of the report was chosen since no official databases of food waste operators exist. Such listings that include only food retailers that have taken part in food waste initiatives in collaboration with third party organizations were not considered objective for the purpose of the research that aims to define private food waste reduction activities implemented by the leading retailers themselves. Deloitte's (2014) listing was considered appropriate since the retailers are listed on the ground of revenue and the report has no predetermined link with any kind of responsibility related topics. The retailers that were included in the target group are presented above in table 3.

Deloitte's (2014) global retailer listing includes 45 food retailers whose country of origin is in Europe. The 37 retailers that have carried out some kind of programs aiming to reduce food

waste and report about them in their CSR reports or homepage publications form the target group of the research. The eight retailers that did not report about any activities related to food waste were not included in the target group, although their publications do address waste management in general.

The retailers of the target group represent 15 different countries of origin. The leading countries of origin according to their prevalence are UK (6), Germany (4) and France (4). The eight leading retailers of the target group originate from these three countries. Each of the retailers operates between one and 36 countries and the average amount of countries of operation is eight. Although most of the retailers are centered in Europe, some of them reported operations beyond the European borders.

All of the retailers are non-specialized and they utilize supermarket, hypermarket, discount store or cash & carry formats. Several of the retailers combine different store formats. The most popular operational format is the supermarket format, which covers over half of the target group. Only one retailer operates in the cash & carry format.

The revenues of the retailers in the target group vary between 3.878 billion and 1.01 trillion USD. Thus, there is a significant difference of 97.391 billion USD between the revenues of the leading retailer and the smallest retailer in the target group. However, even when the revenue of the leading retailer is over 26 times higher than the revenue of the smallest one, all of the retailers can be considered large on a global scale. The average revenue of a retailer is 28.5 billion USD. Five of the retailers are included in the group of the ten leading global retailers. The total revenue of the top five retailers of the target group represents 42 percent of the total revenue of the target group.

The concentration ratio CR_4 , which describes the total output produced by the four market leaders, is 35. Thus, the market can be considered competitive. However, while analyzing the competitiveness with the concentration ratio, it should be taken into account that country specific differences exist and the overall situation of the competitiveness in the European food retail sector is complex. Thus, in this context not much weight should be given for the concentration ratio in the description of the target group. (Hansen 2013, 247.) If the eight retailers that were not taken into account in the research due to the lack of efforts in food waste programs are considered in the descriptive calculations of the target group, the average

revenue of a retailer would be 27.2 billion USD and the CR₄ would be 30. This does not have any significant relevance as the differences are not prominent and the concentration ratio refers to a competitive market.

While the retailers of the target group have significant differences in their store formats and expansion strategies, there are common characteristics, too. All of them originate from Europe, they operate at least partly in Europe, they all sell food products and they have somehow addressed the food waste issue in their publications.

5.2.4 Collecting data

In this research data was collected from the retailer corporations' CSR reports and homepages. Thus, the information has been obtained from the corporations' internal sources. CSR reports, or annual reports in their absence, were emphasized as primary sources of information. Due to limited resources, only the most recent available report of each retailer was reviewed. Any kind of publications related to food waste initiatives in the corporations' homepages that dated between the years 2011 and 2014 were analyzed as secondary sources of information. While the data constitutes mainly information from verbal publications, some of the homepage publications included non-verbal communications, such as videos and pictures. As a remark, it is worth noting that some of the international retailers operate through subsidiary companies that are controlled by a parent company. In this research, due to limited resources, only information provided on the parent companies' websites was taken into account.

The timescale of four years from 2011 to 2014 was chosen as a frame in order to gather up-to-date information from the current decade. The main reason for the selected years was due to the EU's renewed CSR strategy for the mentioned timescale. As the renewed strategy is considered to be the guideline for European enterprises, including all food retailers, it is likely that its introduction has had an influence on CSR practices and reporting in comparison to the previous years. The EU renewed its strategy in order to "better clarify what is expected of enterprises," to improve the visibility and transparency of CSR reporting and to address the negative development of environmental impacts, such as the issue of "green washing," a misleading marketing tool used in practices, such as product labeling. Furthermore training and education were emphasized in the promotion of sustainable development and responsible citizenship. (European Commission 2011a, 5–12.) To gain profound comprehension about the

food waste initiatives implemented, while taking into consideration that not all companies report about their responsibility efforts on a yearly basis, it was determined rational to include publications from a four-year timescale in the research material despite of the fact that only the most recent CSR reports could be examined.

The first step in the process of collecting data was, without exception, the review of the latest CSR or annual report. The report was analyzed thoroughly and all topics that were somehow related to food waste reduction were taken into account (e.g. description of processes, attitudes, strategic statements, numerical data, values, future prospects, etc.). The data that in any way described the efforts was condensed and registered in the theory-based scheme.

Following the collection of information from the CSR report, additional data was gathered from the online homepage of the retail corporation. McMillan (2000; ref. Krippendorff & Bock 2009, 60–67) suggests that studies that apply the content analysis method in the “World Wide Web” should specify the scope of the website that was reviewed. In this research the secondary sources were discovered broadly by scanning through the retailers’ homepages. All links (e.g. news, fact sheets, reports, interviews, responsibility descriptions, strategic statements, interactive material, etc.) of the corresponding time frame from 2011 to 2014 related to food waste or waste management in general were reviewed. The scanning was carried out by executing a search with the key words “food waste,” “food losses” and “waste management” in each of the retailers’ homepages. The key words, which according to McMillan (2000) can be risky to use if not properly designed, were considered appropriate for the purpose. Links that directed to external websites which were not directly related to the corporation and duplicate information mentioned earlier in the report were not taken into account. The information gathered was then condensed and recorded.

The review of homepage publications was a tool to gather information of such food waste efforts that were not mentioned in the CSR reports. Each source of data was examined according to the sections of the structured scheme. The examination of information begun with a review of the basic factors, which included an analysis of the causes of food waste that were being addressed, it continued to an analysis of responsibility dimensions, and it was concluded

with a survey of the outputs. The division of the sections was considered appropriate, giving a clear structure to the research process.

5.3 Information obtained

The amount of information that was obtained from the various retailers' publications was not equal. Due to the chosen research method the sources of information were predefined, but the reporting practices and the formats of the publications differed among the retailers. 30 retailers out of the target group of 37 had published either CSR or annual reports that contained information about food waste management. 24 of the reports were CSR reports or similar (e.g. sustainability reports) and five were annual reports. One report was a combination of the two, referred to as an "annual and social" report.

Most of the reports were detached files that were accessed through links on the retailers' homepages. The reports were mainly in PDF format, but other formats were also present. A few of the reports were not detached, uniform reports proceeding page by page in line with chapters or topics, but short publications that were directly on the retailer's website, referred to as "reports." They could not have been printed in their format as such and they were different from the "traditional" CSR and annual reports. Seven retailers did not include any kind of information related to food waste in their CSR or annual reports. Nevertheless, they did report about such efforts in their homepages, and thus they were included in the target group.

Homepage publications included material, such as strategic information, responsibility publications, press reports, news, advertisements, blog posts, videos and interactive material. The publications provided updated and older detailed information about several food waste programs that were not mentioned in reports. Such additional information was gathered from the publications of 36 retailers. Only one retailer did not provide any additional information about food waste practices on its homepage, and thus its CSR report was the only source of data. Homepage publications were the only source of data for the seven retailers that did not include any information about food waste management in their CSR reports.

The reporting of the retailers was unsystematic and incomparable, as suggested in the theoretical overview (Gray et al. 1995, 47; Dubbink et al. 2008, 401; Reynolds & Yuthas 2008, 50; see also Jones et al. 2005, 891). There were clear differences in the amount of information

the retailers provided and the ways how the food waste issue was being confronted. Some publications were brief, while others contained wide amounts of information and data. The researcher did not observe any absolute correlation between the extent of reporting and the extent of the implementation of food waste programs. However, some of the retailers that reported extensively seemed to show more activity in responsible long-term food waste management than some of the retailers that reported very briefly.

There were significant variations also regarding the types of waste that were being emphasized in the CSR reports. Some retailers emphasized food waste over other types of waste, others stressed other types of waste over food waste, and again, others reported equally about several types of waste. Clear differences could be observed between the retailers' waste management strategies: while some retailers mentioned food waste as one of the main focus areas of their responsibility strategies, others emphasized comprehensive waste management strategies that balance the importance of different types of waste.

Two thirds of the retailers included some numerical data about their food waste reduction progress or targets in their publications, but the amount and accuracy of data offered varied greatly. The numerical waste reduction data was not comparable between the different operators because no official regulations for its registration or presentation has been set. Some retailers expressed necessity for common procedure models and guidelines. One retailer mentioned to have set a target of working with the retail industry and the British Retail Consortium to "develop a standard method for measuring and reporting the food waste generated within food retail".

Most of the information provided in the publications concerned the current time period and provided information about actualized food waste programs. However, the communications included statements about future goals and plans, such as waste reduction targets, efficiency goals, plans for the launching of new food waste projects, awareness-raising campaigns, training, the development of common guidelines for different organizations and the development of waste treatment and energy recovery. As an example, three retailers mentioned to have set a food waste reduction target for the year 2020 and some retailers have set targets of "zero landfill waste" for the coming years.

6 Analysis

This paper aims to define what kind of food waste initiatives have been implemented among the leading European food retailers during the last four years. The research's objective is not only to map out activities, but to gain comprehension about the characteristics, dimensions and impacts of responsible food waste management in the business field. The paper aims to define whether certain specific causes of waste are in the scope of the food waste initiatives and to examine if the retailers' efforts have common characteristics or what the differences are. The analysis summarizes the findings of the empirical research. Its aim is to answer the research questions and thus solve the objective of the research (Heikkilä 1998, 139) by forming a clear verbal description of the field studied (Tuomi & Sarajärvi 2002, 110). As the research was done by applying a deductive approach, the analysis is based on the concepts of the theoretical framework.

The following analysis is divided into three sections. The first section describes the characteristics and the variances in the food waste programs, and additionally it presents differences in their implementation. In the second section the efforts are analyzed according to the cause of food waste they target. The goal is to define which reasons of food waste have been most frequently in the sight of the retailers and to describe the nature of these initiatives. The causes of food waste are divided according to their stages in the FSC, which provides information about the orientation of the activities. Thus, the analysis does neither aim to compare retailers' practices between each other, nor does it try to define which initiatives are the most "successful" or the most "efficient" ones. The third section compares the analysis with the literature of CSR; the food waste actions are analyzed in relation to their CSR dimensions and outputs.

6.1 Variety of food waste programs

The retailers' food waste programs can be divided roughly into two groups: some aim to prevent or optimize the creation of food waste, others are reactive. All except two out of the 37 retailers reported to have implemented activities that have the prevention of food waste as a primary target. The two retailers that did not report about any preventive actions in their

publications concentrated only in reuse, recycle and/or waste recovery processes in their food waste management operations. All of the retailers' activities examined focused on avoidable or possibly avoidable types of waste – none of the retailers mentioned the utilization of unavoidable types of waste.

Proactive initiatives included actions such as improvement in logistics, packaging, or storing, training of employees or other stakeholders, processing or price reductions of foods close to expiration, betterment of stock management, reduction in packaging sizes, development in the requirements of aesthetical factors, donations and awareness raising campaigns aiming to reduce household food waste. These kinds of practices target the different causes of food waste and aim to avoid the creation of refuse in the first place. Reactive efforts, such as the development of recycling practices and processing of food waste into biofuels, do not directly aim to reduce food waste. Their main target is to deal with it in a way that some value would be saved at disposal. (WRAP 2009, 92; European Commission 2010b, 4; UNEP 2014, 24.)

The duration of the responsibility efforts demonstrated great variation. The shortest food waste programs were reported to have lasted only for one or two days. Such short-term initiatives included in-store campaigns, special events and operations aiming to raise awareness. Conversely, some initiatives were planned to last for several years. Some retailers have food waste reduction targets until the year 2020 and they have implemented detailed strategies to achieve them. Retailers that had long-term plans emphasized the importance of continuous development of procedures. A number of programs were planned to last for non-specified periods of time.

While some retailers have implemented food waste programs individually without third party operators, several retailers named organizations with whom they collaborate. The organizations included both national and international associations, such as WRAP, local food banks, technological institutes, FUSIONS (EU research project), charities, governmental bodies, research centers and consumer unions. One significant observation was that all the retailers originating from UK reported collaborating somehow with WRAP. The retailers originating from other countries did not have any common organizations that would have been mentioned by several of them.

While some retailers linked their food waste reduction initiatives to operational, strategic, social, environmental and/or philanthropic reasons, various retailers did not detail any specific reasons for their efforts in food waste management. Food waste reduction itself was emphasized as the main reason for the activity.

The strategic nature of the food waste programs varied from philanthropy to efforts that were integrated with the core business and further into innovative business models. Among the philanthropic initiatives, donations to food banks or other charities were mentioned being in the core of the waste management practices. Integrated actions included initiatives whose objective was to reduce waste along the FSC or in the retailers' own operations in order to increase efficiency. Such actions included proactive efforts, such as better stock management, price reductions of products close to expiration, the development of packaging and cooperation within the stages of the FSC.

Only few retailers reported to have developed clearly innovative solutions and new fields of business related to food waste. These included actions, such as the development of a shelf life indicator tool (see section 6.2.3). Also new product lines and marketing models were developed as a result of loosening aesthetical requirements for vegetables and fruits, which in turn have led to reductions in field losses, the emerging of new business models and/or increases in sales (see sections 6.2.2).

While analyzing the strategic orientation of the retailers' responsibility activities, it is worth noticing that not everything is always communicated to the public. Retailers may have specific reasons for their waste strategies that are communicated only internally. Financial, operational or other reasons may exist. As the reports and homepage publications present viewpoints of the retailers themselves, not all facets can be expected to be disclosed in the material used for this research (Gray et al. 1995).

The target group members appear to have adapted the use of both national and international guidelines to some extent. GRI was the most commonly mentioned guideline used in reporting as nineteen of the retailers were found to follow its recommendations. The Dow Jones Sustainability index was mentioned in three reports. In addition, some retailers mentioned to

follow BSCI, BSCE, the Global Compact agreement and EMAS. However, as these guidelines intend to address various industries, they discuss waste management in general with no specifications towards controlling food waste.

6.2 Causes and means of prevention addressed

The food waste programs implemented by retailers examined in this research vary a lot and they address different causes of waste (figure 7). The most common causes of food waste that the retailers have targeted with their programs are related to the lack of information, attitudes and abundance, the expiration of products and the lack of cooperation within the FSC. By contrast, some causes of waste, such as the failure in complying with the regulations, errors in food preparation, difficulties in removing content from packages, attitudes in production and issues related to overproduction and premature harvesting have not been in the scope of the retailers' activities. Accordingly, while most of the causes of food waste that were listed in the theoretical part of this paper have been addressed by the retailers in the target group, some of the causes were not mentioned by any of the retailers.

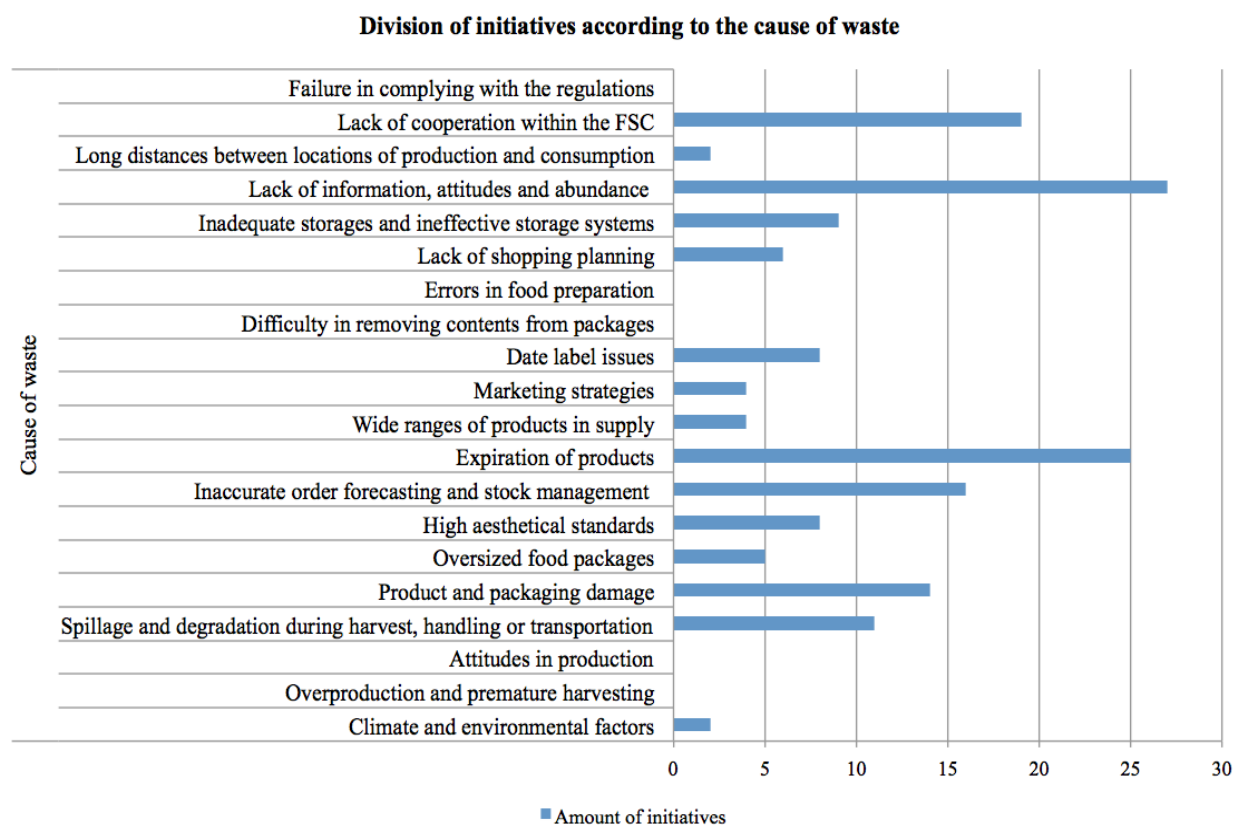


Figure 7. Proportion of initiatives that target each of the causes of food waste.

The following sections describe what kind of programs target each of the causes of food waste. The causes are classified according to the stage of the FSC they correspond to. The division of stages, however, is only approximate, as some of the causes tend to encompass several stages and affect various operators of the FSC. All of the causes and means of prevention that are listed in the following sections were mentioned in the retailers' publications in relation to food waste. If the topics were mentioned on their own or in relation with other issues without any expressed relation to food waste, they were not registered.

As the intention of this research is not to compare the retailers with each other, but rather to compare the food waste efforts and the emphasis between the different causes of waste that have been addressed, the analysis is compiled without making references to specific retailing companies. Thus, the names of the retailers are not disclosed in the text. However, in order to increase reliability, the activity of each retailer of the target group can be observed in the data display (Appendix 3). Citations compiled from the retailers' publications give insight of how the causes of food waste have been addressed.

6.2.1 Agriculture and manufacturing

The agricultural and manufacturing stages include the causes of food waste that occur in the early parts of the FSC. Overproduction, premature harvesting as well as climate and environmental factors are causes that occur in the agricultural stage controlled by farmers. Waste due to spillage and degradation during harvest, handling or transportation are considered to be causes of food waste created in both agricultural and manufacturing stages. Waste occurring in storages or during transportation can also occur in the later stages of the FSC, but in this section they are addressed as part of the early links. The issues of oversized food packages, process interruptions, product and packaging damage and attitudes in production are related to manufacturing.

The agricultural stage of the FSC was not in the scope of the retailers' activities – only two retailers mentioned having implemented activities aiming to reduce losses in the fields by exploring climatic and environmental factors. This included the development of satellite and aerial mapping technology and a modern weather prognosis system. Neither overproduction, premature harvesting, nor the attitudes in production, were directly mentioned by any of the retailers. The reason why food waste creation occurring in the agricultural stage was not in the

retailers' scope remains somewhat confusing. One reason for the little attention given to this area could be that the retailers lack contact with the agricultural sector. If retailers purchase their products from manufacturers or some other intermediary operators, they may not have any direct contact with the agricultural sector.

Waste due to spillage and degradation during harvest, handling or transportation was mentioned in 11 reports. Most of the publications associated food waste with handling and transportation leaving harvest losses without prejudice. The role of harvest losses was mentioned in only one report in relation to waste of grapes that are left to rot in the fields and in two other reports in relation to the reduction of waste due to aesthetical requirements – the requirements that retailers have about the appearance of agricultural products (see section 6.2.2). These requirements were loosened by four retailers with the target of reducing field waste.

Waste due to handling and transportation were being addressed with activities such as the training of suppliers, the creation of accurate cold chains, the building of new storages and supply centers that are logistically suitable and the development of practices, guidelines and monitoring systems that help in using resources as wisely as possible and in recognizing the bottlenecks in the procedures. Some retailers expressed that they deal with the above-mentioned causes of food waste only with a vague reference: “the development of processes.”

“Our commitment to securing food supplies starts with our suppliers: in a nutshell, we need to improve yields per unit area and increase the share of marketable good without plundering natural resources. [– –] We invest in efficient transport, packaging and merchandise management systems to maintain the quality of food as long as possible.”

(Metro Group 2012)

It should be taken into account that in addition to the 11 retailers who reported about development of practices that related to food waste, some retailers reported on improvements in cold chains and transportation without any mentioned connection to food waste. Efficiency and the development of procedures were related to energy efficiency and sustainability in general.

Product and packaging damage

Packages that are insufficient or inadequate can contribute to the creation of food waste (HLPE 2014, 61). Prevention of product and packaging damage as a key to reduce food waste was mentioned in 14 reports. Process interruptions were not mentioned in the reports. Several retailers addressed the prevention of food waste caused by packaging damage with the development in packaging technology. According to the findings, packaging technology is often carried out in cooperation with processors or other partners, such as technological institutes or universities. Two retailers mentioned that they donate products that are suitable for consumption, but whose packages have been somehow damaged. Some retailers reported to have implemented environmental award competitions that encourage stakeholders to invent sustainable procedures. In 2014 one retailer gave award to an idea that aims to improve food packages for the purpose of food waste reduction.

Relatively little attention was being given to product and packaging damage as a cause of food waste, although the topic was mentioned by several retailers. As the retailers themselves do not manufacture the food items and their packages, they possibly consider the responsibility for damage to belong to other operators, such as manufacturers and logistics. Another reason for little attention given could be that the development of packaging materials and technology could have led to a decrease in the amounts of food waste caused by product and packaging damage. Thus, it possibly is not considered a significant cause of food waste among the retailers.

Oversized food packages

Five retailers disclosed that they have reduced the package sizes of the products they provide or offered a wider selection of package sizes in order to reduce household food waste. Some of the retailers have integrated vertically, and thus they can easily control the production of some of their products, especially private-label products. Other retailers that do not take part in the actual manufacturing process reported to be collaborating with the manufacturers or requesting them to offer products in smaller packages.

"We've also made changes to our products like 45 g bag of our popular Italian salad to help prevent waste in our customers' homes." (Sainsbury 2013)

One retailer published data on its own food waste figures. According to the retailer, almost 70 percent of all bagged salad ends up being wasted and half of it is wasted in households. To confront the issue the retailer announced to cut back on offering large bags of salad and promote smaller packages.

The reason why the issue of oversized food packages was not popular among the retailers' food waste programs could be due to strategic orientations. Retailers can possibly gain higher revenues if consumers purchase large amounts of foods. The costs of packages and in-store processes can possibly decrease if products are sold in quantities. Another reason for little attention given could be related to a lack of contact and influence with manufacturers.

6.2.2 In-store and retail activities

In-store and retail activities include all of the responsibility activities that are directly linked to retailers and their internal management operations. These include addressing food loss causes such as high aesthetical standards, wide ranges of products in supply, poor order forecasting and stock management and excessive in-store expiration.

High aesthetical standards

High aesthetical standards do not concern only the retail stage of the FSC – they are strongly linked with the agricultural and manufacturing stages too. The aesthetical norms set by for agricultural products cause field waste in the early stages of the FSC (Gustavsson et al. 2011, 11). The eight retailers that addressed the topic have loosened their standards and some have found ways to create value with the purchase of imperfect food items that are not uniform in shape or size. Retailers reported to sell such products at reduced price, to utilize them in processed food products or animal feed and to use them in catering services. One retailer announced donating such products to charities and “those in need.” Four retailers mentioned that they have loosened the standards of agricultural products without specifying any particular product. One retailer specified that they apply the relaxed standards only for carrots and another one only for bananas. The reduced requirements applied were presented giving exact examples concerning particular products.

"At Morrison's, a potato smaller than 45 millimeters in diameter will be taken out of the load and used as baby roasters or, if they are really small, as animal feed. Nothing is thrown away." (Morrisons 2014a)

The utilization of imperfect fruits and vegetables that due to aesthetical requirements would be lost created some innovative business activity too. One retailer reported to have carried out a pilot project of "Inglorious Fruits and Vegetables" the idea of which is to sell the "non-calibrated and imperfect" fruits and vegetables at a reduced price. One goal of the initiative is to make customers understand that such products are suitable for consumption. Raising consumers' awareness is crucial, as western consumers have gotten accustomed to purchasing products fulfilling the ideal visual standards (Godfray et al. 2010, 816). As a part of the project, the retailer designed a new private-label product line of soups and fruit juices produced from imperfect ingredients that usually get rejected. The initiative was actively marketed in the media and it turned out to be successful: the store traffic grew by 24 percent and the average sales increased. The retailer has expanded the project to be implemented in more of its stores.

Inaccurate order forecasting and stock management

Stock management related topics, such as the development of stock rotation systems, training of staff, improvement in monitoring and in the creation of common guidelines for orders and stock management were among the most common causes of food waste that the retailers have intended to eliminate. The topic was mentioned in the publications of 16 retailers. Order forecasting and stock management were often related to strategic and financial aspects leading to cost savings and to wiser use of resources, which makes them important for the development of in-store efficiency.

The development of stock management in cooperation with the agricultural sector and processors was mentioned by some retailers who proclaim that cooperation, such as the sharing of information, standardized quality controls and the development of systems that could detect bottlenecks in the chain, can lead to better management and hence the reduction of waste. Some retailers have developed automatic ordering and inventory systems which help in the management of stock levels and thus avoid the expiration of products in shelves.

"The purpose of UTRAD (Depreciated Product Management Unit) is to minimize unsold merchandise throughout the entire value chain by recovering depreciated items to sell in

Outlet stores, thus leading to a reduction in unsold merchandise, waste and transport."
(Sonae 2013)

Three retailers stated that vertical integration, one of the reported trends in food retailing, provides them flexibility in the operational management allowing fast ordering processes, efficiency and economies of scale. According to the retailers, the flexibility and efficiency have led to the reduction of food waste.

"With our Group companies interconnected by our own logistics fleet we effectively own, operate and control a greater proportion of our fresh food supply chain than is typical for major grocery retailers in the UK. [—] This enables us to manage and reduce associated waste and related costs. By having a greater degree of control over more of our fresh UK food chain we are able to drive efficiency through flexibility from the farm to our customers." (Morrisons 2014b)

Expiration of products

The expiration of products was a frequent concern among retailers, as 25 out of the 37 retailers assessed it in their publications. The expiration of products causes losses of incomes for retailers as products that are no longer suitable for human consumption are wasted. Several retailers that targeted the expiration of foods focused on reactive activities instead of prevention. Both the development of recycling and disposal practices and the use of food waste in energy recovery were relatively common topics. Some of the actions aimed at encouraging customers to recycle waste without pointing out the negative impacts of food waste and without sharing any tips for its reduction. As an example, some retailers reported to provide compostable carrier bags as a way of encouraging food waste recycling.

The disposal of food waste creates costs for retailers who must invest on waste treatment and pay landfill taxes. One third of the retailers reported to have set a "zero landfill waste" target or to be developing processes that aim to reduce landfill waste.

"Products are only designated as waste when they have passed their use-by dates and are considered unfit for human consumption. We utilize secure storage areas and / or locked waste bins to dispose of such products because allowing them to be consumed by members of the public would constitute a significant health and safety risk. All our food waste is

ultimately disposed of through an environmentally friendly process of anaerobic digestion: we do not send any food waste to landfill." (Iceland 2014)

There were significant differences between the retailers in their disposal practices. While some have reached the zero landfill targets in all of their operational countries, others have reached them only in certain locations. At the same time, some retailers have aimed to reduce landfill waste without absolute targets, some others are on the path of developing practices to prevent it, and others did not address the issue at all.

"We have set targets that challenge us to divert waste from landfill, increase our rate of recycling and reduce the environmental impact of our packaging." (John Lewis Partnership 2014)

Significant differences were observed also in the progress of organic waste conversion among the retailers who reported to have it as a target of their waste disposal practices. Some retailers are already converting part of their food waste into energy and others are developing practices in order to enable the conversion in the future. One retailer reported to convert all expired fruits and vegetables produced in one of its store formats into a natural fertilizer.

"Lorries run on biomethane, a fuel produced by the methanisation of biowaste from 14 hypermarkets." (Carrefour 2013)

"One exciting option is the development of a network of local anaerobic digestion and biomass energy plants that use food waste as fuel to generate electricity. This would mean that almost no food waste would need to go to landfill." (Aldi 2014)

Besides reactive actions, the creation of food waste caused due to the expiration of products was being targeted in several preventive ways. Several retailers reported to reduce the prices of products close to expiration and some sell such products at reduced prices for employees or community shops. Further processing of products was relatively common as expiring products are being converted to meals or other products. As an example, one retailer reported to process rye bread chips out of bread that would get wasted otherwise. In addition, two retailers reported to develop procedures in cooperation with other operators of the FSC in order to give perishable products a longer shelf life. Some retailers stated also to be taking part in packaging development projects, the advancement of storing methods or the improvement of

transportation practices. One retailer was about to open smoothie and soup bars using unsold fruits and vegetables in selected pilot stores.

Donating expiring foods to food banks, associations and “those in need” was common among retailers dealing with expiring food items. In total 27 retailers reported to donate food that was under risk of being wasted. Donations were mentioned most often in relation with the expiration of products, but a few retailers donated also products with damaged packages or with aesthetical imperfections. One retailer reported to have launched a yearly competition that rewards the best ideas that promote sustainability and in 2013 and 2014 the rewards went to ideas support the reduction of food waste. The 2013 winner idea aims to avoid waste due to the expiration of products by delivering goods to the Norwegian Salvation Army and other organizations.

Some retailers mentioned keeping the expiring products on shelves as long as they have not reached their expiration dates and are fit for human consumption. Others donate products directly to charities or food banks as soon as they are considered to be close to expiration. One retailer has developed a computer application for its Irish supermarkets, which allows them to upload details of excess food. The information obtained through the application is then used to collect surplus food from 146 stores and given to community groups and charities. Another retailer reported to remove fresh products from the shelves four days before the expiry date in order to give consumers enough time to consume perishable products. This was justified by the guarantee of maximum food safety. The residual flows were reported to be processed into other products.

The expiration of products does not concern solely the retail stage. It is closely linked to the consumer stage too. Several retailers reported to encourage consumers to use leftovers instead of wasting them. This included advice such as the provision of tips, recipes and instructions to preserve foods. Recipes for leftovers are provided on websites, but also in the social media, in customer magazines, during events and in the stores. One retailer reported to have taken part in to a cookbook project that aims to reduce food waste in Norway. The book provides tips for the efficient use of leftovers. Another retailer mentioned its website to have a “leftover tool” in which customers can enter the surplus ingredients they wish to use. The tool then recommends the most suitable recipes for the leftovers. In addition, meal planning tools,

awareness-raising, seasonal campaigns, and customer events were mentioned by some retailers.

"Make Your Roast Go Further" campaign encouraged customers to use leftovers to create two extra meals, and provided helpful hints and tips including "7 ways to cut your food bill", "how to store leftovers" and "meal planners made easy." (Sainsbury 2013)

Two retailers have taken advantage of the modern technology in the implementation of food waste programs. They have developed interactive websites and phone applications to raise consumers' awareness about household food waste prevention and recycling, including issues related to the expiration of food products.

In order to help consumers preserve foods during transportation and thus avoid premature expiration, two retailers reported to be selling insulated thermal bags. One retailer that previously provided insulated thermal bags reported to be gradually replacing them with "rigid cool boxes" in order to help customers preserve products even better. Again, it should be taken into account that probably several other retailers provide their customers with insulated thermal bags or other similar tools, but they just do not mention it in their publications in relation with food waste.

Wide ranges of products in supply

The supply of large quantities and wide ranges of products leads to the expiration of products and the creation of food waste (Gustavsson et al. 2011, 13). The provision of wide ranges of products was mentioned in the publications of four retailers relating to food waste. Relatively little attention paid to the issue may be partly due to its connection with the expiration of products. Also, the development of order forecasting and stock management that optimizes product rotation can play a role if slowly rotating products and bottlenecks are detected. If so, the retailers may consider that a reduction of product supply is not needed. Furthermore, Stenmarck et al. (2011, 39–40, 77–81) argue that as retailers want to respond to customer demand they have a certain sensitivity towards meeting customers' expectations about wide product ranges and constant availability. Hence, activities that aim to reduce the amount of products offered are not considered favorable among retailers.

Several retailers mentioned that they are doing customer research in order to respond accurately to the demand. Some researches' aim was to clarify customer preferences about product ranges. One research associated the issue of wide ranges of product supply strongly with stock rotation. An analysis of product sales had led to the identification of underselling products that were creating waste. The retailer had removed such under-performing products from the stores' selection, which had led to a reduction in food waste burdens and cost savings.

Some retailers addressed the issue of large variety of products in supply by giving examples of specific product groups. One retailer reported to encourage its bakeries to bake more frequently smaller quantities of bakery products instead of baking large volumes. Thus, the bakeries can follow the demand and estimate more precisely the quantities needed. Consequently, consumers can be provided with fresher products. Another retailer emphasized daily orders of perishable food items, the monitoring of sales and planning as tools for always having the right amount of products in supply.

"Our butchers make new cuts of meat throughout the day to ensure freshness and avoid leftovers. If, contrary to expectations, the butcher has ordered too much meat, he will lower the price or freeze the product so it can be prepared and sold in our delicatessen. Similarly, the baker produces fresh bread throughout the day in order to avoid overproduction and ensure that freshly baked products reach our customers. Any food loss that we cannot avoid is used for energy production or animal feed." (Dansk Supermarked 2014)

It is worth noting that several retailers mentioned wide ranges of products and constant availability as a positive asset. Meeting customer expectations was ranked high in the missions of several corporations. The offering of wide ranges and products was seen as an advantage by some retailers. This can be considered contradictory with other retailers' efforts in reducing the quantity of their supply in the name of food waste.

6.2.3 Consumer-level activities

Consumer-level activities refer to food waste reduction efforts such as awareness-raising, marketing strategies encouraging the purchase of large amounts of products, correcting date label issues, improving the handling of packages and adjustments in food preparation. These activities all have an aspect of household food waste reduction and they aim to directly target customers.

Marketing strategies

The renunciation of marketing strategies, such as “2 for 1” or “Buy one, get one free” that encourage consumers to buy food products impulsively in quantities regardless the need (Gustavsson et al. 2011, 14) were mentioned in the publications of four retailers. One retailer reported to have substituted promotional offers of perishable products sold in quantities for offers promoting products that can be frozen: “Buy one, get one free” promotions have been switched to “Buy one, freeze one promotions.” Another retailer has replaced quantity driven promotions with value driven promotions and thus aims to reduce food waste provoked by marketing.

"We have also helped our customers reduce their food waste by switching emphasis of our promotional offers – particularly on perishable goods, such as fruit and vegetables – from volume-led deals, such as "buy one get one free", to value-driven promotions, such as half-price offers. This means customers buy what they need, rather than doubling up on items they don't necessarily want simply to take advantage of the promotional deal." (Co-Operative Group 2014)

One retailer mentioned to be using an EDLP (Everyday Low Price) pricing strategy, which is founded in the idea of constant low prices without need for discounts. According to the retailer, the EDLP pricing strategy permits the lack of sales and the maintenance of constantly low prices. This practice is especially attractive to consumers who purchase relatively large amounts of foods on each trip (Bell & Lattin 1998). As reported by the retailer, the use of EDLP pricing avoids impulsive purchases over need, and thus it is considered to be a strategic tool in the confrontation of unnecessary food waste.

One of the retailers announced that it has dropped quantity driven promotions to avoid consumers to purchase impulsively. However, the retailer admitted to using targeted promotions for perishables, such as vegetables and salads, to reduce in-store waste. From the retailer's point of view this can be seen as an efficient way to act responsibly aiming to reduce both household waste and in-store waste. On the other hand the action can be seen to be contradictory as with the targeted promotions the retailer can generate consumer purchases over need. Is the retailer aiming to reduce in-store waste by selling perishables at lower prices and transferring the waste to the households? Do the targeted promotions of perishables

encourage consumers to impulsively purchase items that are not needed? All in all, marketing strategies and their implications are relatively difficult to analyze as they can have multiple impacts. Marketing strategies can at times possibly simultaneously reduce waste in one place and provoke its creation in another place.

Date label issues

Eight retailers mentioned to have confronted the issue of incorrect label interpretation, which is considered to be a major cause of food waste (HLPE 2014, 52–53). The actions taken included awareness-raising campaigns related to date label information interpretation, changes in the utilization of date labels and the extension of use-by dates.

One retailer reported to have used an additional date label system of “to be sold until.” The label system “mattered for internal processing purposes,” but it was recently abandoned as it was noticed to confuse customers. Food items were wasted because their labels were interpreted incorrectly by customers who thought that the products had passed their expiration dates.

“We will inform customers about this distinction [“to be used until” vs. “best before”] by means of posters in the store. This way, they will throw out less products that are still edible.” (Colruyt Group 2014)

One of the proposals that concerns the date label issue was innovative: a retailer cooperated with Keep-it, a Norwegian technology company (Keep-it 2015), to produce and take into use a shelf life indicator that shows whether food that has passed its expiration date or is still edible. The tool measures the temperature of the product and if during the whole storing process the food item has been in under four degrees Celsius, the product is considered to have some additional days until it actually expires.

Difficulty in removing contents from packages

The issue of packages being so difficult to handle that the consumption of the entire content is not easily possible was not addressed by any of the retailers. Packaging technology was mentioned only in relation to environment friendliness, product safety and preservation. No references were made to the ease of use. The reason why retailers did not address this issue is not clear. One cause could be that consumers do not even realize that containers are not fully

empty before discarding the packages and consequently the issue remains unnoticed. Thus, it is possible that the food industry is not aware of the issue if no feedback is being given.

Errors in food preparation

Errors in food preparation referring to situations where food is wasted because of dissatisfaction or inappropriate handling was not mentioned by any of retailers. The issue of “errors” in food preparation is precise and none of the retailer addressed it as such. A mean for the prevention of the issue is the provision of training and recipes, which in this research was considered as awareness-raising related to lack of information.

Lack of shopping planning

Six retailers provided tools for addressing the issue of lack of shopping planning. The issue was confronted by information sharing through campaigns, events and the development of a special website combating food waste. One retailer has developed an application, which offers guidance in dinner planning and purchases. In addition, another retailer reported to have published a recycling guide including shopping planning advices and another one provided “anti-waste coaches” in stores.

One retailer presented a program promoting and offering tools for shopping planning. The “WOW Food Waste Diary” is an online diary, where consumers can record information about the foods thrown away. In addition the retailer provided tips and ideas for food waste reduction in households.

The reason why retailers pay little attention to the consumers’ lack of shopping planning can be due to strategic objectives. Retailers may consider that consumers’ impulsive and unplanned purchase behavior could increase their profits. Thus, retailers may confront a situation where their economic goals do not meet the ideology of sustainability.

6.2.4 Whole supply chain

This last section contains causes of food waste that concern several supply functions or stages of the FSC. It includes causes of food waste such as inadequate storages, long distances between locations of production and consumption and lack of cooperation within the FSC. The issue of failure in complying with regulations was not addressed by any of the retailers in relation with food waste.

Inadequate storages and ineffective storage systems

Nine retailers addressed the issue of adequate storing of foods. Waste due to storage conditions is mostly an issue in developing countries. However, even if the impact of storage conditions as a cause of food waste is relatively low in middle- and high-income countries, ineffective storage systems can create waste along the FSC there too. (Gustavsson et al. 2011.) The improvement of storages along the FSC is crucial for the reduction of waste (HLPE 2014, 58).

Storage depots can be situated far from the retailers, increasing the distances that food products need to be transported. They can also have inadequate cooling facilities, structures or monitoring systems, among other problems. In addition, the employees of the storages can be unaware of the most efficient procedures. In order to confront this problem, some retailers provided training and instructions for storage workers.

The issue was in the focus of several retailers who were working for the development of storages, warehouses and/or distribution centers in order to reduce waste. The efforts included activities, such as the maintenance or renovation of equipment, the development of technological systems, the improvement of efficiency and the building of new facilities.

"The storage instructions show the best way to keep all the different types of loose fruit and vegetables that we sell in order to maintain freshness." (Co-Operative Group 2013)

The inadequate storing of products can cause food waste additionally in households and during transportation. The storing of products can be linked with the expiration of products, as products that are not stored correctly can expire prematurely. The retailers addressed the issue in various ways. One retailer provided consumers online shopping storage advice with a guide that informs customers of better storage practices. Another retailer, who claimed that apples are a product group out in which 40 percent gets wasted, provided its customers tips on how to store apples so that they would last longer. In addition, two retailers reported to provide insulated thermal bags to help customers to preserve foods better during transportation.

Lack of information, abundance or attitudes (Awareness-raising)

In high-income countries, where the availability of food is great and people can afford excess consumption of food, waste can be directly generated due to attitudes and abundance (Gustavsson et al. 2011, 14; HLPE 2014, 55). The fact that Europeans use a relatively low

percentage of their income on food reduces motivation to avoid waste. Consumers have adapted habits to purchase food only with the highest aesthetical standards, while simultaneously commercial pressures can encourage waste with aggressive marketing strategies and big portion sizes. (Godfray et al. 2010, 816.) Lack of information, abundance and attitudes do not concern only the consumption stage – they can additionally be reasons for the occurrence of other causes of waste, such as pre-harvesting, incorrect label interpretation or inadequate storing. Consequently, awareness-raising campaigns are implemented with a variety of means and targets.

27 retailers mentioned to have adopted some kind of awareness-raising programs to increase the information level of stakeholders or to affect their attitudes or counteract the feeling abundance. The awareness was raised through several channels. The channels for information sharing include the retailers' websites, social media, phone and computer applications, customer magazines, videos, intranet networks, advertisements, flyers, events, fairs, in-store televisions and product labels. One retailer mentioned also to be using e-learning tools for employees and a "forum" for suppliers, without defining the concepts. Some awareness-raising actions were proactive aiming to prevent the creation of food waste, others were reactive raising awareness about correct disposal of waste.

Some retailers had an aspiration to raise consciousness about food waste and its impacts in general. Thus, it can be considered that they address the issue of lack of information, abundance and attitudes as a direct cause of food waste. Others focused in the awareness-raising on the causes of food waste, such as incorrect date label interpretation, inadequate storing, lack of shopping planning and the expiration of foods, to mention a few.

"Our mission to make life easier for customers includes guidance on how to keep food fresher for longer. This storage advice appears on packaging, online and in our regular magazine, helping customers reduce food waste and save money. We also support the Love Food Hate Waste campaign which offers practical advice for consumers and can help save money." (Morrisons 2014c)

While many of the awareness-raising actions were implemented individually by the retailers, some cooperate with third party organizations. As an example, one retailer reported to sell products in packages that contain tips against food waste. The tips were drawn from WRAP's

Love Food Hate Waste program. Several other initiatives were also carried out in cooperation with organizations that have expertise about sustainability issues and awareness-raising activities.

There were significant differences between the duration of awareness-raising campaigns. Among the retailers that offered information about the duration of their activities, some were short-term and others continued for longer periods of time. The short-term campaigns varied from a few days to a few months. Such campaigns sometimes coincided with events, such as the UN's World Environment Day or the "United Against Food Waste" event held by FUSIONS. Some actions were continuous or long term projects extending from one up to seven years.

"To coincide with World Environment Day 2013 which was organized around the theme of food waste, several initiatives were implemented in France to raise customer awareness."

(Groupe Casino 2014)

Several retailers reported to offer their employees and/or suppliers training to raise their awareness about food waste. The topics of training varied, as some focused on informing on the impacts of food waste, some aimed to train employees and suppliers in reducing waste and others promoted recycling practices. Three retailers had also launched campaigns encouraging employees and suppliers to share their ideas on food waste prevention. As an example, one retailer launched an internet challenge for its employees and announced it would reward the best employee ideas and it would give a prize to the supplier that performs the best.

Long distances between locations of production and consumption

As the FSC's have become more international and the geographical distances between the locations of production and consumption of food products have extended (Lundqvist et al. 2008, 21; Parfitt et al. 2010, 3067; Hansen 2013, 16–17), products supplied by retailers represent a great variety of origins (Lundqvist et al. 2008, 20). A great amount of food products have been produced, processed or packed in different locations than where they are sold to consumers and finally consumed. The transportation of food products from one place to another means that products need to maintain their quality for longer (Lundqvist et al. 2008, 20) in order to prevent the creation of waste due to long transport distances (HLPE 2014, 109). Thus, there is a growing need for the development of techniques that improve the preservation

of food products making them less perishable (Kenny 1998, 4; HLPE 2014, 56). Only two retailers reported to be seeking solutions to reduce distances between locations of production and consumption in respect to food waste.

The first of the two retailers reported to have shortened the FSC's for certain products, such as grapes, apples, pears, tomatoes and mushrooms. The motivating factor was the desire to cut back on field and consumer waste. According to the retailer, in the case of grapes field losses occur when suppliers are not able to forecast demand. As a result they end up with unsold grapes. Household waste, in turn, occurs when consumers discard the grapes when they get soft. To avoid waste the retailer has guaranteed its grape suppliers to buy at least 80 percent of the total yields allowing the suppliers to forecast better the demand. As a result, the retailer has managed to shorten its distribution chain and the time taken for the grapes to arrive to the country of destination has reduced. Consequently, the grapes are being delivered sooner to the customers and the consumable time of the product has increased.

The second retailer reported to be taking part in a joint campaign launched together with other organizations aiming to rise the appreciation of food. As a part of the program the retailer pursues a “multi-layered strategy against food waste,” which includes the goal of using short transport routes between warehouses and markets. Although the retailer mentions the strategic goal of shortening distances, it does not report about any tangible procedures.

Some retailers reported to work towards the development of supply chain technology, logistics, storages and/or IT systems to improve the efficiency in the delivery of products. However, such things were not taken into account in relation with the topic of reducing long distances between production and consumption, as they did not clearly define the aim of shortening of distances. The development of supply chain technology, logistics, storing and IT were analyzed under the causes of “waste due to spillage and degradation during harvest, handling, storage or transportation,” “inaccurate order forecasting and stock management” and “the expiration of products,” depending on the orientation of the efforts.

As only two retailers directly addressed the issue, the reduction of distances between production and consumption locations does not seem to be in the scope of retailers' efforts. Several retailers mentioned that their main target is to answer to the customer demand and to

provide wide selections of products. As consumers' interest towards new foods from distant regions and the consumption of perishable and non-seasonal products have risen together with the growth of incomes (Kenny 1998, 4; HLPE 2014, 55–56), retailers are tempted to respond to the demand rather than reducing the variety of products with long transportation distances. Also the economic benefits of purchasing products from remote locations may encourage retailers not to reduce the distances if it means that suppliers would need to be changed. However, it should be taken into account that such retailers that have invested for example in the development logistics may simply not have been reporting about the aim to reduce distances, as they may not have acknowledged the issue related to food waste or the reporting was being kept short for other reasons.

Lack of cooperation within the FSC

To curb the quantity of food waste, it is necessary to involve various entities – both within and outside the food sector (Lundqvist et al. 2008, 30; HLPE 2014, 95). This paper concentrates on the private sector and the participation of different operators is analyzed within the FSC from the perspective of the retailers. The lack of cooperation within the FSC as a cause of food waste (HLPE 2014, 55) seems to be a popular topic as it was mentioned by over half of the target group; 19 retailers reported about it.

The shared responsibility of stakeholders was emphasized by several retailers who mentioned being combating food waste in the FSC in various stages. The importance of incorporating all the stages of the FSC in the battle against food waste was mentioned in part of the publications.

“We involve customers, suppliers and the entire public in our efforts, because only if we act together can we be successful.” (Metro Group 2014)

Some publications pronounced the importance of specific links of the chain and emphasized long-term relationships with suppliers. Among the cooperative activities, retailers mentioned to have implemented training programs and offered learning tools. A couple of retailers reported to be sending food waste back to manufacturers in order for it to be processed to animal feed. Retailers have also taken part in the development of new technologies, processes and working practices.

"We are committed to combat food waste in the supply chain in various stages. Together with manufacturers we work to improve the processes around inventory and transportation." (Jumbo Groep 2014)

One retailer announced to have set up an independent "supply chain advisory panel" to develop processes in the chain. Another one has designed a self-evaluation framework together with other organizations in order to support responsibility among suppliers. Three retailers emphasized the role of vertical integration as a booster for cooperation within the FSC – as vertically integrated retailers have the absolute command over more than one stage of the supply chain, they claim to increase efficiency and control.

"We buy direct from primary meat and produce farmers and suppliers in the UK and utilize more of what we buy through our own abattoirs or produce pack houses. We buy whole animals and where practical, we have the capability to process whole crops. This enables us to manage and reduce associated waste and related costs. By having a greater degree of control over more of our fresh UK food chain we are able to drive efficiency through flexibility from the farm to our customers." (Morrisons 2014d)

Vertical integration can be seen as slight deviation from the "traditional" form of cooperation within the FSC as one enterprise is in charge of various stages of the chain. Depending on the degree of the alliances, vertically integrated retailers can extent processes themselves without any need for creating mutual understanding with external entities.

6.3 Triple Bottom Line dimensions

Since the establishment of CSR in the business field and in the society, it has been relatively clear to corporate executives that businesses should aim to balance the three dimensions of responsibility (Carroll 1991, 39; Jamali 2006). The following sections examine the different dimensions of the TBL that can be observed in the food waste programs of the leading European retailers. The target of the following sections is to point out the economic, social and environmental dimensions of the initiatives in order to gain better comprehension about their nature.

As responsibility actions tend to encompass several of the responsibility dimensions, the division should not be interpreted with very defined limits. The examples presented further can have aspects of more than one dimension although they are presented under a certain topic.

6.3.1 Economic dimensions

Although no financial data was analyzed in this research, some economic dimensions were identified in the analysis of the food waste initiatives. Approximately one fourth of the retailers reported to have gained economic benefits through the implementation of food waste programs. Some retailers reported about additional economic benefits that the presence of food waste activities have generated to other stakeholders, such as farmers, manufacturers, suppliers and customers. While analyzing the economic characteristics of the initiatives, it should be kept in mind that although some kind of economic benefits have been gained, usually the implementation of responsibility actions creates some expenses, too. While some operations create one-time costs, others generate continuous expenses. (Weber 2008, 254.)

Many of the retailers reported to have reduced the amount of in-store food waste through employee training, processing expiring foods and improvements in developing of stock rotation, storing and shelf-life, among other means. The reduction of in-store waste has direct impacts on retailers' income, as wasted food products create costs without yields. Especially the processing of foods can be economically beneficial if the costs are low, value is added and the final products are sold with high profit margins. In turn, if in-store food waste is being reduced with food donations, there are only minimal economic benefits for the retailer. By donating products retailers can save economic resources that would have been spent in the disposal process, but the purchase price of the products and the expected profits are lost. Thus, retailers pursuing maximum profits should emphasize the development of in-store procedures and the training of employees in order to make the store functions more efficient and to avoid products ending up being donated.

It is likely that the retailers who reported to have carried out new business by creating innovative food waste initiatives have gained competitive advantage leading to economic benefits. As an example, the retailer that implemented the pilot project of “inglorious fruits and vegetables” reported the trial to have been successful. The growth of store traffic and average sales indicate that the project that reduces waste due to lowered aesthetical

requirements potentially creates competitive advantage and positive economic outputs. However, as retailers did not actively report about the gains of their activities, the existence of business benefits is not provable.

The reuse of foods that are no longer suitable for human consumption has economic impacts if the products are converted to something that creates value, such as animal feed. The retailers, however, did not directly point out the economic benefits of reuse in their reports. The development of recycling practices was seen to have economic value dimensions in the cases where landfill and handling costs were reduced. One retailer reported to be providing recycling bins for used cooking oil that it processes into biofuels. According to the retailer, the produce can be sold, or in some cases, used in internal processes.

Some retailers argued in their reports that their food waste activities have positive indirect economic impacts on stakeholders. Two retailers mentioned that better efficiency in their processes keeps the prices lower, which is beneficial to the customers. It was also noted, that such customers who succeed in reducing food waste in their households as a result of programs implemented by retailers can possibly reduce their food expenses. Furthermore, cooperation within the FSC, which was emphasized in the reports, was considered to have beneficial fiscal impacts for the different operators of the FSC.

While analyzing the economic results of the food waste initiatives, it is worth keeping in mind that the initiatives can also create indirect economic impacts that are not automatically positive. As an example, the retailer who assured to its grape supplier to buy at least 80 percent of the yield can raise the supplier's income if the products would not have been sold without the retailer's assurance. On the other hand, if the assurance obliges both the retailer and the supplier, the supplier may lose income if the assurance prevents it to sell the grapes to another buyer willing to offer higher prices.

6.3.2 Environmental dimensions

The multiple negative impacts of food waste on the environment have been discussed in several researches (Coggins 2001; Lundqvist et al. 2008; WRAP 2009; Gustavsson et al. 2011; HLPE 2014). The environmental impacts of food waste are enormous. The environment is affected by the production of the food supply from its initial point until the aftereffects of disposal. As all food waste causes some environmental impacts, it can be considered that all

the initiatives that have somehow, directly or indirectly, succeeded in reducing the food waste burdens have environmental dimensions.

Environmental aspects of food waste efforts were observed in various kind of responsibility activities concerning all the stages of the FSC. For example, several retailers reported to have reduced agricultural and in-store waste by processing products with aesthetical imperfections or foods close to expiration. 27 retailers also mentioned that they donate foods that for an unspecified reason cannot be sold and a couple of retailers talked about selling foods close to expiration to employees or selling them in community shops. Such practices are considered to reduce waste in the retail stage. The above mentioned practices are regarded to be better options than disposal (WRAP 2009), the least preferred option of the food waste hierarchy (UNEP 2014, 24), as the negative environmental impacts are avoided.

Besides reducing the absolute amounts of waste, retailers' food waste efforts can have several indirect environmental dimensions. Several of the responsibility programs contribute with more sustainable practices in agriculture, logistics, storing and in consumption, among other areas. Some retailers reported about the provision of waste to be used as a source for renewable energy. Such practices can benefit the environment as emissions are reduced and resources are used more efficiently, even if the EU's waste legislation suggests that the prevention of food waste should be emphasized at the first measure and reuse and recycling should be focused on only after preventive actions (European Commission 2010b, 4).

Environmental improvements were in some publications paralleled with economic benefits: three retailers mentioned to have reduced landfill, handling and transportation costs by decreasing the amounts of landfill waste. Some retailers also reported the environmental responsibility to have yielded improvements in overall performance, and one retailer expressed its mission to be "UK's greenest grocer" and that to be "great for our business but even better for the environment".

6.3.3 Social dimensions

The most frequent social dimension that retailers associated with food waste in the publications were donations. The redistribution of surplus food was seen to have positive

social impacts, as food is philanthropically delivered for disadvantaged consumers. Although donations can be considered to have positive social and environmental impacts, they do not have direct positive impacts on a retailer's economic performance.

Food safety, which can be associated with the social dimension of the TBL as it can affect public health and consumer confidence (Yeung & Morris 2001), was mentioned by only two retailers in the same context as food waste. One retailer reported to remove fresh products from the shelves four days before expiration and to process them. Although the products are removed from the shelves, they are not wasted. The model of further processing is not contradictory with economic and environmental responsibilities. The processed products can generate income and environmental damage from wasting is avoided as products are being converted. The other retailer aimed to develop processes to overcome food safety challenges related to food donations.

When food waste is reduced through training or other kind of educational means, the process can have social dimensions. Despite the fact that awareness-raising campaigns and training operations are popular among retailers, only few retailers mentioned their social aspects. Retailers may consider the social dimension of such operations self-evident or they may not recognize it at all.

Some retailers argued that food waste activities that lead to better efficiency and a wiser use of resources have the potential to decline customer prices. Customer prices, in turn, can be considered to have social dimensions. Although some retailers mentioned the reduction of food waste to lower their retail prices or to affect demand rates, only few retailers highlighted the social dimension of moderate pricing.

6.4 Outputs of the activities

The theory of CSR's outputs argues that all CSR activities may produce one or more of three outputs, which are learning, reputation and CSR outcomes (Lankoski 2008b). The following sections focus on the analysis of the outputs that can be observed in the retailers' food waste programs. As the level of information varied and many of the food waste activities were only recently being implemented, several retailers did not report about any potential or observed outputs.

6.4.1 Learning

Several retailers reported about investments in Research and Development (R&D). Some of the retailers reported such activities to have led to positive results and organizational learning. Learning through responsibility related R&D activities can be considered to be intentional learning as the objective of such “CR [corporate responsibility] activity is to obtain and analyze information” (Lankoski 2008b, 538).

The R&D activities implemented included customer research, technical research, the development of operational practices, systems and applications as well as participation in non-specified R&D activities implemented by third party organizations. The learning that was obtained through customer research can be considered as learning that can improve the processing and utilization of information related to stakeholder expectations (Lankoski 2008b, 538). Some of the obtained learning can also be considered innovative, as new things were being invented (e.g. the temperature measurement tool developed with Keep-it, interactive websites and phone applications).

Also monitoring the amounts of products that get wasted has according to some retailers led to learning. One retailer reported that the monitoring of the “top 15” packages that tend to break helped the retailer to discover which packages are in most need for further development. As the target of the monitoring was to discover packages in most need of further re-design, the learning can be considered intentional. Some retailers reported to monitor their stocks in general in order to keep track of efficiency and rotation. Such activity could enhance learning as it increases the retailers’ expertise.

In addition, internal audits and the use of consultants were reported to have improved learning about in-store processes and bottlenecks that create waste streams. One retailer suggested that learning about the inefficiency of procedures encouraged the organization to improve constantly. As the objective of internal audits and the use of consultants is usually to obtain information, the learning can be considered intentional.

Some retailers reported to have invested in the utilization of modern computer systems in order to make processes more effective. The two retailers that had addressed the issue of field waste due to climatic conditions reported to have taken into use aerial mapping and early prognostic systems. Such activities can be considered to be regular learning enhancers as the companies

have obtained intelligence that has already been available elsewhere before being taken into use in their own operations (Lankoski 2008b, 538).

The training of employees and other stakeholders was reported to have led to learning and the improvement of processes. Several kinds of training programs were presented: some focused on internal processes, some others on awareness, and others on processes that were not in any way related to the organization's operational objectives (e.g. the reduction of household food waste among employees). It is difficult to define whether learning through training was organizational or individual. Some of the training potentially led to organizational learning and some did not. The learning result depends on the type of training provided as well as the way it is adopted and applied by the receivers. As an example, one retailer stated that it has provided its employees training about the causes of food waste. The training was said to have increased the employees' capabilities to take care of appropriate storing and handling which resulted in better preserving of in-store foods. As the knowledge gained through the training was reported to have benefitted operations inside the company, it is considered as organizational learning.

6.4.2 Reputation

None of the retailers directly mentioned reputation to be the reason for their efforts in reducing food waste, nor that the food waste activities would have improved reputation. However, several retailers reported the will to respond to stakeholder expectations as a motive to act in a responsible way.

In this research the information obtained stemmed from internal sources. The only sources of information were publications provided by the corporations themselves. In order to examine the image stakeholders have of the retailers in a more profound way, it would be essential to include some external sources, too. Although external sources can provide misleading information, their examination could offer a wider perspective of the retailers' image.

The retailer that had launched the “inglorious fruits and vegetables” project reported its store traffic and average sales to have grown since the implementation of the initiative. The retailer did not directly express the project to have affected its reputation, but it is likely that the media coverage has affected how customers see the company. The reputation may have been obtained as a result of the responsible business practices of the retailer or customers may have

been reached through lower prices. Thus, no definite conclusions about reputation can be drawn.

6.4.3 Outcomes

The most common output that was detected in the retailers' reports was the one of environmental outcomes. Environmental outcomes were the foundation of all food waste programs. As all initiatives aimed somehow to reduce or manage better food waste streams, all the efforts that were reported to have been successful are considered to create at least some kind of environmental benefits. The environmental outcomes are strongly linked to the environmental dimensions of the TBL and they can be considered having been fulfilled.

The social outcomes were present in some of the retailers' reports, but unlike the environmental outcomes, they were not a foundation of all food waste programs. The betterment of the social environment was associated with donations, food safety, learning and food prices. The social outcomes are strongly linked to the social dimension of the TBL and the learning output. Consequently, rather than reviewing all of the potential social and environmental outcomes, to avoid repetition, this section analyzes the effectiveness and the different forms of the results that were reported.

Several retailers provided numerical data about the amounts of food waste they create. All the retailers that provided it, reported to have reduced the amounts of food waste. Hence, the activities can be considered to have created positive CSR outcomes. Depending on the extent, goals and successfulness of the actions, there can be great variation between the levels of positive impacts the outcomes have. However, as the reporting of the retailers varied greatly and the disclosure of data did not follow any common guidelines, it is not possible to analyze or to compare the environmental outcomes in detail.

Some activities prevent waste only in stores, while other activities are extended throughout various links of the FSC or even across horizontal processes. Some environmental outputs are direct, such as all initiatives leading to absolute reductions of food waste, while others can create indirect environmental outcomes. Actions, such as the development of new packages, do not directly reduce food waste. However, as the improved packages are introduced and taken into use, they can prevent the creation of waste due to packaging damage or premature expiration. A couple of retailers announced to have taken part in packaging development, but

none of them claimed to reduce the absolute amounts of food waste as a result of the better packaging.

Some reported results are not verifiable. As an example, consumer awareness-raising programs can lead to a reduction of household food waste, but at the same time they may fail to create any impacts. Although consumer awareness-raising activities were common, the retailers did not report about achieved outcomes. In the case of awareness-raising campaigns concerning employees and suppliers, some retailers reported to have reduced the amount of waste in stores or along the FSC while others did not report about any social or environmental outcomes.

7 Conclusions and discussion

In this paper, the characteristics of the food waste activities implemented by the leading European food retailers were examined from various perspectives. A familiarization about the theoretical background of the research provided a broad comprehension about the food waste issue, the European retail sector and the concepts of CSR, which were further applied in the empirical part of the research. The qualitative method of the research provided great variety of descriptive and informative data.

The analysis serves as a base for the conclusions presented in the following sections. They aim to answer the research questions by defining what kind of food waste programs have been implemented among the leading European food retailers during the last four years, which causes of waste the initiatives target and what common factors can be observed. The results of this paper are furthermore compared with previous research. The second section asks for further study and considers the limitations of the research.

7.1 Main findings

The research demonstrates that there is a lot of variety among the food waste programs implemented by the leading European retailers. The retailers examined in the research followed the EU's and UN's hierarchies for waste treatment, according to which prevention should be emphasized as a primary option, followed by reusing or optimizing, recycling, recovering waste for other purposes and ultimately disposing (European Commission 2010b, 4; UNEP 2014, 24). The finding consorts with the findings of the Nordic food waste research, which found that decreasing food waste is a priority for retailers (Stenmarck et al. 2011, 41). A common factor for all of the retailers' initiatives is that they targeted avoidable or possibly avoidable types of waste. None of the retailers reported to have developed practices to reduce or exploit unavoidable types of waste.

The food waste initiatives differed greatly regarding their duration. Some activities were only a few days long, while others lasted for years or were continuous. However, some of the retailers did not specify the duration of their initiatives. Variation was also observed in the ways retailers realized their food waste initiatives. While some retailers implemented them

individually without third party operators, others cooperated with different stakeholders, including national and international organizations. One significant common factor was observed, as all of the initiatives implemented by retailers originating from the UK were somehow cooperating with WRAP. In the case of food donations, the majority of retailers reported to cooperate with local food banks.

The strategic approach of the food waste programs varied. Among the initiatives, some were reported to be philanthropic, while other were integrated into the retailers' core business. Some food waste programs managed to create innovative solutions that had not been introduced before. Although there were signs that innovative food waste efforts have possibly improved business performance and generated competitive benefits, no solid conclusions can be drawn based on the information gathered in this research.

Several causes of food waste were named in the theoretical part of the research, but not all of them were mentioned in the retailers' publications. Based on the information gained in this research, no conclusions can be drawn about the motives for why some causes were not addressed at all.

The most popular cause of food waste that the retailers emphasized in their activities according to the findings was the one of "lack of information, attitudes and abundance." Thus, it can be considered that the leading European retailers acknowledge relatively well the significance of raising the stakeholders' knowledge about food waste. The second most popular topic was the one about the "expiration of products," followed by the "lack of cooperation within the FSC" and the "inaccurate order forecasting and stock management." As all of the four causes are related to the retail sector and in-store waste streams, it seems that the retailers preferably develop such food waste management practices that are closely related to their own business. This correlates well with the literature, which suggests that the integration of responsibility efforts with the core business likely creates potential benefits (Halme & Laurila 2009), which is something retailers must appreciate.

The findings related to the targeted causes of waste correlate relatively well with the findings of previous food waste research. Stenmarck et al. (2011, 41–42) found that several of the food waste initiatives that have been implemented in the Nordic countries are linked to ordering, customer behavior and education, which in turn are frequently linked with the expiration of

products and labeling issues. Also WRAP's (2012) research about UK retailers' efforts in reducing household waste found that in comparison to the organization's previous survey retailers have increased activity in awareness-raising and reacting against the expiration of foods especially in relation with date label issues. The research, however, focused only on household food waste and it did not consider food waste activities in the earlier stages of the FSC.

The results of this research do not permit the drawing of solid conclusions about why some causes of food waste are more often in the scope of the retailers' activities than others. Previous research suggests that as the mission of the food retail sector is to maximize profits with high sales, the objective is not always coherent with the aim of cutting down food waste (Stenmarck et al. 2011, 38; Silvennoinen et al. 2012, 36). Thus, some activities may better suit the objectives of retailers than others. Stenmarck et al. (2011, 37–38) suggest that retailers are sometimes not interested to react on such causes of food waste that likely generate waste in households if waste can be avoided in stores. The argument is based on the assumption that waste created in households does not create economic losses for the retailer. Such retailer attitudes were, however, not reported in any of the publications of this research. On the contrary, several retailers stated that they willingly help customers to reduce the waste they produce in households. However, it should be kept in mind that reports are not always reliable and they can represent untruthful information (Reynolds & Yuthas 2008, 55).

The environmental dimensions of responsibility were more present in the retailers' food waste activities than the social dimensions. This correlates with previous research, which argues that firms tend to report less on social aspects than on environmental issues (Kolk 2003, 279; Sridhar and Jones 2012, 96; ref. Adams 2002). In addition, it can be considered that although food waste has various social and economic dimensions, the environmental ones are often visible and possibly more multidimensional – food waste has negative impacts on the environment even after it has been discarded (Lundqvist et al. 2008, 26; Silvennoinen et al. 2012, 41). The economic dimensions were disclosed in some reports, but not as extensively as the environmental ones. The retailers that referred to the economic dimensions related food waste activities with the firms' economic performance and cost savings or with impacts to stakeholders.

The analysis for the outputs of the activities was challenging as many retailers provided information only about the implementation of food waste actions without evaluations about progress and results. Especially the analysis of reputation is considered to lack objective basis. The analysis of learning and CSR outcomes resulted for their part less challenging than the analysis of reputation as more information was provided.

The implementation of food waste activities has led to learning among some of the members of the target group. Learning has been achieved through activities that are somehow related to R&D. In some situations learning through R&D processes has led also to the development of innovative solutions. Thus, it can be considered that some innovative learning has been achieved through food waste programs. The monitoring of internal activities and the use of consultants and audits in order to detect bottlenecks also seems to have enhanced learning. Retailers that have applied modern technology systems in order to make their procedures more effective are considered to have achieved regular learning. The role of training remains to some extent confusing as the analysis could not define whether learning achieved through training was organizational or individual.

Several retailers have created CSR outcomes with the implementation of food waste activities. The most common output was environmental as it was considered to exist in all situations where food waste actions have led to a reported prevention or reduction of food waste. Among the CSR outcomes there were both direct and indirect outcomes. The environmental outcomes include absolute reductions in food waste burdens, which can be considered beneficial for the environment, but also indirect outcomes related to a more efficient use of resources.

At least some food waste programs have led to cost savings that benefit the retailers as well as other stakeholders. Although previous research has not defined whether food waste programs can create positive outcomes for businesses, research such as the one by Smith (2008, 859) suggest that options that promote “more sustainable FSCs [– –] can create benefits both for the businesses and for others in the FSC” emphasizing the role of “multi-stakeholder initiatives” where “farmers, academics, innovators, governments and NGOs” cooperate with food businesses. Smith’s (2008) findings correlate with the findings of this research which suggest that food waste programs can lead to positive outputs that can benefit the operator who implements the responsibility program as well as other stakeholders.

7.2 Limitations and implications for further study

This research found that retailers have addressed the food waste issue in various ways. There were clear differences in the implementation of the initiatives and the effectiveness and scope of the efforts. While some retailers have realized several programs that target various causes of food waste, others have not done anything to confront the issue. There were clear differences in the food waste programs regarding their orientation towards waste treatment. While some efforts concentrated on proactive waste management, others were reactive and focused on the development of recycling practices or the further use of waste in energy recovery. However, it should be noticed that due to limited resources the research has limitations that can affect the results. The potential obstacles were taken into account in the implementation of the research.

One of the limitations of this paper is related to the method and materials that were used. It is possible that the analysis of additional sources of data, such as managerial interviews or other external sources could have provided more information about retailers' food waste efforts from a wider time scale. Thus, the use of external sources of data could have offered wider perspective to the research. In addition, their use could have contributed with achieving broader comprehension about how the activities of retailers are seen in the eyes of different stakeholders. However, due to limited resources, the qualitative content analysis of internal publications was chosen as a research method and it is considered to have provided sufficient amount of reliable information for the purpose of this study.

The risk of lack of rigor was taken into account before the implementation of this research. In order to minimize the risk and increase reliability, the methods of the research were planned carefully. The material of the research, CSR reports and homepage publications, is non-reactive, secondary data. In other words, the documents existed already before the realization of the research. (Livesey 2014, 57.) Thus, the researcher had no effect in the creation or content of the documents, which makes them objective for the purpose of the study and increases reliability. However, the interpretations made by the researcher may differ from interpretations another researcher would make. The effect of individual factors affecting the interpretation of the food waste initiatives was minimized with a rigorous orientation to literature and with structured proceeding methods.

A directed approach of qualitative content analysis was chosen partly because its process is considered more structured than the processes of alternative approaches (Hsieh & Shannon 2005, 1281; ref. Hickey & Kipping 1996). Each food waste initiative was evaluated using a structured scheme based on the theoretical framework. The scheme ensured that the research proceeded on a structured way and that all the data was analyzed with identical processes. Its use was considered to increase reliability as it permits the researcher to preserve data (Miles et al. 2013, 311–312).

The condensing of information during the evaluation process, however, faced certain risks. Material removed from its context can lead to false interpretations, or may get lost due to bias or carelessness (Yin 2014, 150). As information obtained from the publications was condensed, the researcher had to consider what kind of information was relevant for the research. In addition, the researcher had to summarize it in the most descriptive and comprehensive way. In the analysis, a risk occurs if the researcher misunderstands the meanings of the data registered in the scheme or is unable to perceive concepts. The aim of the analysis is to provide wider knowledge by unifying the compact data in a way that reliable conclusions can be constructed. (Tuomi & Sarajärvi 2002, 110; ref. Hämäläinen 1987.) The above-mentioned possibilities of bias or false interpretations were taken into account in the data collection process and further in the analysis. In order to minimize the risks, the researcher considered the obstacles of the research in the methodical planning.

Before the implementation of the empirical part of the research, it was considered that the investigation of data could have turned out challenging due to language barriers if the data was not going to be available in any of the languages (English, French, Spanish, Swedish and Finnish) the researcher knows. In order to avoid false interpretations due to linguistic factors, two external native translators were consulted in the analysis of Italian, German and Dutch data.

Although all the retailers of the research are from European origin and operate at some extent in Europe, several of them also operate in other regions. Most of the publications mentioned the locations where the food waste programs have been carried; in that case only, European

initiatives were registered. However, there is a possibility that some geographically undefined examples of food waste efforts that were taken into account in the research have not been implemented in the European places of business. This may cause a slight distortion in the final analysis that aims to consider the efforts solely from a European perspective.

The reason for why some causes of food waste are more often in the scope of retailers than others could be the interest for further study. Such research could reveal whether corporations' objectives sometimes play against food waste reduction as was argued by Stenmarck et al. (2011, 37–38) and whether retailers are genuinely willing to battle household food waste, like what was argued by some of the retailers of this research. The topic could be studied by investigating managerial attitudes and retailers' strategic goals. If the business' missions are incoherent with food waste reduction, it would be important to find means to balance the incoherence.

The findings provided in this paper provide information that could be applied by food retailers planning to participate or implement responsibility programs related to food waste. However, motivation is needed in order to convince more retailers to take part in the battle against food waste. The presentation of motivational strategies could help retailers “to overcome barriers to action” (UNEP 2014, 43). Future research could focus on the examination of the different outputs that responsibility activities can create. In addition, research could aim to take into account economic parameters to point out what kind of economic gains organizations can attain by reducing food waste along the FSC. Furthermore, the potential competitive advantages that can be achieved with food waste operations could be analyzed. The potential of policies that encourage companies to prevent food waste should also be taken under rigorous research.

In addition, it would be important to examine the effectiveness of food waste operations. Although this research succeeds in defining what kind of activities have been implemented and which causes of food waste are most often in the scope of the leading European retailers; the initiatives' effectiveness was not studied. This would have required information about investment costs and revenues, as well as detailed research information about outputs.

In order to gain an understanding about the retailers' activity in different market environments, it would be interesting to compare European retailers' activity with initiatives implemented by retailers in other markets. A comparison of activity could potentially lead to a wider understanding of the issue and provide managerial implications if information was shared.

8 List of references

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Appendices

Appendix 1. The theory-based scheme.

Retailer

**Country of
origin**

Links to the sources

Links to the sources

**Amount of countries of
Operation**

**Retail
Revenue**

Operational Format

Sources

Themes	Data	1. CR reports	2. Homepage publications of the company
1. Basics features	Brief description of the initiative: What has been done? What has been achieved?		
	Causes: What cause(s) of food waste does the initiative address?		
	Time scale of the initiative		
	Organization of the initiative: individual, partners, part of an		

	organizational program...		
	Reporting: How wide is the reporting?		
	<i>Comments</i>		
2. CSR dimensions	Social		
	Environmental		
	Economic		
	<i>Comments</i>		
3. Outputs	Outcomes: improvements in the social or environmental impacts of the firm		
	Learning: potential behaviors by the organization are changed through the acquisition, distribution or interpretation of information		
	Reputation: the image stakeholders		

have has changed		
<i>Comments</i>		

Appendix 2. Example of the registration of data: Tesco PLC.

Retailer: Tesco PLC**Country of origin:** UK**Amount of countries of operation:** 13**Store format:** Hypermarket**Revenue:** 101 269 m USD

	Phases of the gathering of data	
Data	1. CR reports	2. Publications of the company (homepage)
Report type	CSR Report: "Tesco and Society Report 2014"	<ul style="list-style-type: none"> · PDF publication about food waste processes: "How we calculate our food waste" · PDF publication "KPMG Independent Assurance Statement" · "Reducing food waste" and "Our three big ambitions" site under "Tesco and Society" · Blog articles "What are we doing to help cut food waste" · "Food waste hotspots", "Fighting hunger, tackling food waste", "World Food Day" · "How we calculate the food waste from our UK operations" · News release: "Tesco tackles food waste" and "Philip Clarke addresses the Global Green Growth Forum (3GF) in Copenhagen" · CSR half year update "Corporate Responsibility 2014/15 half-year update"
Year of the publication	2014	2012-2014

Brief description of the case: What has been done? Social, environmental or economic responsibility goals?	Reduction of waste in store and along the FSC. Main things: Analyzing our own operations; tackling the hotspots across the value chain; Donations; Development of food waste profiles for 25 of their most frequently purchased food products and shared data on food waste within their UK operations: Bakeries: encouraging to bake less and more often rather than larger volumes; work with suppliers to extend code life of breads and sweet products; developing promotion plans to help consumers waste less bakery food = raising awareness. Campaigns: Tesco "has hosted a series of roundtables on food waste, supply chains and health". Tesco has established "Young People's Panels in Europe and UK and brought together an advisory panel of international experts to advise on our scale for good strategy" ... "have also set up an independent supply	Ending "Buy one get one free" offers on fruit and vegetables in UK; Surplus donation programs; Co-operation with suppliers; Tips on packages; Targeted promotions for salads and vegetable to reduce waste in those lines; "Leftover Tool" = including a "Love Food, Hate Waste" section to Tesco's Real Food website with tips on how to reduce waste. A key part of that is the leftover tool – customers can enter the ingredients needed to be uses pick out the recipes; FoodCloud in Ireland = an app which allows businesses to upload details of excess food, Tesco can send all surplus food from 146 stores in Ireland to community groups and charities; Work with suppliers , i.e. "No banana left behind" = to ensure smaller and unusually shaped bananas
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	chain advisory panel"; guiding on produce handling; store ordering and "other waste reduction procedures"; redesign of in-store bakeries; reviewing customer preferences; addressing the field losses with satellite and aerial mapping technology; reducing process damage with new technology; developing packaging technology to increase shelf-life; providing more accurate information for customers about product information; Publishing data (transparency, awareness); adding recipes to avoid wasting of leftovers; developing transport and storing to improve quality and freshness; shortening FSC's e.g. for grapes, apples, pears, tomatoes, mushrooms to cut field and consumer losses - has assured to buy at least 80 % of grapes from suppliers - allows better forecast demand - the FSC has got shorter and perishables are in shelf 10 days faster; raising awareness: including food waste facts and recycling tips on packages, introducing in-store greengrocers to assist customers and provide training for staff about leftover usage (mentions: "improving variety, quality and value of fresh fruits and vegetables" = provides wider selection)	are used in Everyday Value and Goodness ranges, processing of bananas, building long-term relationships with 12 South American farms who grow and pack all of their bananas to Tesco; Food Waste Vines = publication of films to share basic tips on what we can all do to help reduce food waste
Which cause is addressed and what is being done for prevention?	Food waste due to expiration; Lack of cooperation within the FSC; Food waste due to lack of information, abundance and attitudes; Food waste due to inaccurate order forecasting and management of stocks; Losses due to climate and environmental factors; Losses due to handling, storage or transportation; Losses due to packaging damage; Waste due to long distances; Waste due to inaccurate storages; Waste due to aesthetical standards; Waste due to marketing strategies	

Appendix 3. Data display of the causes of food waste targeted by the retailers.

	Climate and environmental factors	Overproduction and premature harvesting	Attitudes in production	Spillage and degradation during harvest, handling or	Product and packaging damage	Oversized food packages	High aesthetical standards	Inaccurate order forecasting and stock management	Expiration of products	Wide ranges of products in supply	Marketing strategies	Date label issues	Difficulty in removing contents from packages	Errors in food preparation	Lack of shopping planning	Inadequate storages and ineffective storage systems	Lack of information, attitudes and abundance (awareness-)	Long distances between locations of production and	Lack of cooperation within the FSC	Failure in complying with regulations
Tesco PLC				x	x		x	x	x		x					x	x	x	x	
Carrefour				x			x	x	x			x			x		x		x	
Schwarz U.								x	x								x			
Metro AG				x	x		x		x			x					x		x	
ALDI Einkauf									x											
Groupe Auchan						x		x	x								x			
Casino																	x			
Rewe	x			x				x	x							x	x	x	x	
Koninklijke A.																				
J Sainsbury						x		x	x								x		x	
Intermarché							x										x		x	
Delhaize Group				x		x		x	x										x	
Morrison				x	x	x	x	x	x	x	x	x			x	x	x		x	
Migros G.									x								x			
Mercadona					x		x		x		x	x				x	x		x	
Coop Group									x						x	x	x		x	
Coop Italia							x		x								x			
ICA G.									x			x					x		x	
Jeronimo M.									x											
John Lewis					x												x			

Co-operative					X			X	X	X	X					X	X	X			X	
DIA S.A.					X																X	
Louis Delhaize				X	X	X		X	X								X				X	
S Group				X	X												X	X				
Spar Österreichische																		X				
Dansk Supermarked										X							X					
Kesko Corporation				X	X			X								X		X				
Jumbo Groep Holding				X				X										X			X	
Colruyt G.				X					X			X										
Grupo Eroski									X													
Reitan Group					X			X	X			X				X		X			X	
Coop Danmark A/S					X		X		X									X			X	
Sonae, SGPS, SA								X	X									X			X	
Coop Norge					X			X	X	X								X				
KF Gruppen									X									X				
Iceland Foods Group												X										X
Agrokor d.d.					X			X										X				
	Climate and environmental factors	Overproduction and premature harvesting	Attitudes in production	Spillage and degradation during harvest, handling or transportation	Product and packaging damage	Oversized food packages	High aesthetical standards	Inaccurate order forecasting and stock management	Expiration of products	Wide ranges of products in supply	Marketing strategies	Date label issues	Difficulty in removing contents from packages	Errors in food preparation	Lack of shopping planning	Inadequate storages and ineffective storage systems	Lack of information, attitudes and abundance (awareness-raising)	Long distances between locations of production and consumption	Lack of cooperation within the FSC	Failure in complying with regulations		